

PALAEOLITHS FROM THE BEAS AND BANGANGA VALLEYS, PANJAB

By B. B. LAL

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1. INTRODUCTORY

WITH the Partition of India in 1947, the palaeolithic sites of the Sohan and Indus valleys, discovered from time to time by D. N. Wadia, K. R. U. Todd, Helmut De Terra, T. T. Paterson¹ and others, passed on to the other side of the border, leaving no typical site of the 'Sohan' culture on this side, although certain sites containing a fair sprinkling of Sohan tools did still remain within India. One, however, felt that there was every likelihood of similar palaeolithic sites being encountered in the sub-Himalayan region of partitioned India. This expectation was fulfilled for the first time in 1951, when Olaf Prüfer hit upon certain sites bearing tools essentially of the Sohan type in the valley of the Sirsa, a tributary of the Sutlej, near Nalagarh, the headquarters of a former Princely State in Panjab. At his invitation, D. Sen of the Calcutta

¹H. De Terra and T. T. Paterson, *Studies on the Ice Age in India and associated Human Cultures* (Washington, 1939).

University visited the place and published a short report on the tools and terrace-sequence of the area.¹ Recently Y. D. Sharma came across a few more palaeolithic sites in the Sirsa valley and also noticed the presence of the Sohan lithic industry on the banks of a homonymous river, a tributary of the Beas, near Daulatpur in Hoshiarpur District, Panjab.²

Tools of the Sohan type have been discovered in non-Himalayan regions as well, the more important amongst them being: the Singrauli basin in District Mirzapur, U.P.;³ the valleys of the Gambhiri, Chambal, etc., in District Chittor, Rajasthan;⁴ the Mahi valley in Gujarat;⁵ and the valleys of the Sagileru and Enumaleru near Giddalur, District Kurnool, Andhra.⁶ But the sites concerned cannot be classed as being of the 'Sohan' type, since they contain a much greater percentage of non-Sohan ('Madras') tools.

Returning to the problem of the typical Sohan sites, the author has the satisfaction of recording that during his explorations in the Kangra District, Panjab, in June 1955, he discovered four sites of this class, viz. Guler, Dehra, Dhaliara and Kangra (fig. 1). The first two sites yielded a large number of tools and the latter two only a few; this difference may perhaps be due to the comparative time devoted to the exploration of the sites concerned.

Consisting essentially of Siwalik formations, this region is drained off by the Beas and its tributaries, which ultimately form a part of the Indus system. Suitable pebbles, particularly of quartzite, being available in abundance in the river-beds and -terraces, the area formed a very convenient habitat for the prehistoric man.

During the course of exploration of the area, which lasted for about a week, the author was assisted by Shri U. C. Sharma, Shri Narendra Nath and Shri J. N. Shivapuri, members of North-western Circle of the Department, besides his wife, Kusum Lal. To the preparation of illustrations many hands have contributed. The photographs of the sites were taken by the author himself, but the rest of the related work was done by Shri S. K. Rishi of the North-western Circle. The photographs of the tools are mostly by Shri B. P. Asthana of the Northern Circle and a few by Shri Ranjit Gupta of the Director General's office. The drawings and maps have been prepared variously by Shri Amir Singh, Shri A. K. Ghosh, Shri Jassu Ram, Shri Ram Babu and Shri A. S. Ahluwalia, the first four of the Director General's office and the last of the Northern Circle. To all these persons and to those others who may have helped the author even indirectly, the author's thanks are due.

2. GULER

A. THE SITE

Guler (32° 1' N. Lat. and 76° 9' E. Long.) is a station on the Kangra-Pathankot section of the Northern Railway, about 14 miles from Kangra (fig. 1). The village from which the station derives its name is about three-fourths of a mile south of the latter (fig. 2). Both the village and the railway-station lie on the right bank of the Banganga

¹ D. Sen, 'Nalagarh palaeolithic culture', *Man in India*, XXXV, no. 3 (July-Sept. 1955), pp. 176 ff.

² *Indian Archaeology 1954-55—A Review* (New Delhi, 1955), p. 58.

³ V. D. Krishnaswami and K. V. Soundara Rajan, 'The lithic tool-industries of the Singrauli basin, District Mirzapur', *Ancient India*, no. 7 (1951), pp. 40 ff.

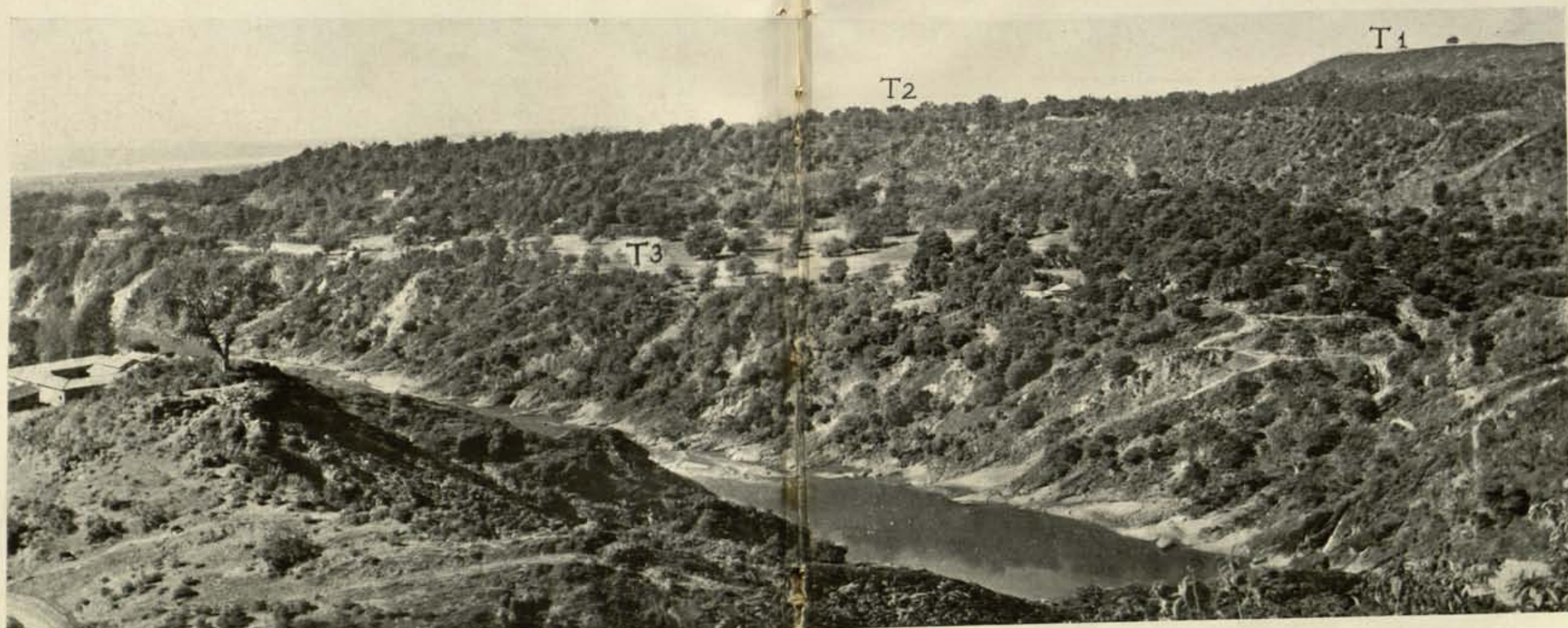
⁴ *Indian Archaeology*, *op cit.*, p. 58. Information from Shri M. N. Deshpande and Shri S. R. Rao.

⁵ B. Subbarao, 'Archaeological explorations in the Mahi valley', *Jour. M. S. Univ. Baroda*, I (1952), pp. 33 ff.

⁶ K. V. Soundara Rajan, 'Stone Age industries near Giddalur, District Kurnool', *Ancient India*, no. 8 (1952), pp. 64 ff.



The Banganga river and its terraces near Guler: view from top of Terrace 1 on Guler side, looking south-east; township of Hariipur on the other side of the river. See page 61



Panoramic view of the terraces of the Banganga near Guler. See page 61



A. View of the Banganga with Haripur fort on the hillock on the right. See page 61



B. View showing the bed-rock (Middle Siwalik sandstone and shales) and the overlying terraces of the Banganga near Guler. See page 61

river, which, originating in the Himalayas to the north-east of Dharmasala, the District headquarters, joins the Beas about four miles south-west of Guler. On the left bank of the Banganga, opposite Guler, is the town of Haripur with a small inspection-bungalow, police-station and high school. Now merged into the district of Kangra, Haripur-Guler was once a Princely State, and a fort, perched on a high rock (pl. XVIII A), bears testimony to its ancient glory.

B. RIVER-TERRACES

A survey of the landscape around Guler¹ brought to light five terraces of the Banganga river, which, beginning from the highest, are named here as T1, T2, etc. (figs. 2 and 3; pls. XVI and XVII). The underlying bed-rock consists of pepper-coloured sandstone interbedded with red shales, which are typical of the Nagri zone of the Middle Siwaliks. Considerably tilted, the beds are laid bare at several places by subsequent erosion (pl. XVIII B).

After walking about 3 furlongs to the north from the Guler railway-station, along the railway-track, one sees to the left a wide gully eroded by a *nullah* which falls into the Banganga. Leaving the track and climbing up and up along the *nullah* to the west one finally emerges on a fairly flat stretch of land measuring about 3×2 furlongs (partly washed away).² This is the highest level ground around Guler, with an approximate height of 565 ft. from the river-level, and has been called Terrace 1. In the north-western sector of this terrace are located a few huts which go by the name of Pirwala Basa. The area on the south is called Trimedi,³ and near the southernmost end of the terrace is the bench-mark of the Survey of India, recording a height of 1964 ft. above mean sea-level. On pl. XVII can be seen the southern sector of this terrace, distinguished by a solitary banyan-tree.

Lithologically, Terrace 1 consists of large-sized boulders, intermixed with medium- to small-sized, sub-angular pebbles and earth (pl. XIX A). Up to 3 ft. in length, the boulders bear prominent 'chatter'-marks (pl. XIX B). The soil is red and sandy. Palaeolithic implements were collected mostly from the surface, near about localities marked A and B on fig. 2.

Terrace 2 is represented by a large flat land, on which is situated the village of Ghatutar (fig. 2; pls. XVI and XVII).⁴ It can be approached conveniently from the Guler railway-station, which, in fact, is situated right at the foot of this Terrace. Its approximate height from the river-level is 375 ft., i.e. 190 ft. less than that of Terrace 1.

In section, the Terrace consists of a thick deposit of silt, under which lie boulders intermixed with pebbles. Having been washed down from Terrace 1 and redeposited in Terrace 2, the boulders in the latter are worn out and are smaller.

Palaeoliths were collected from the exposures alongside a small *nullah* running north-south near locality marked D (fig. 2, where, however, the *nullah* has not been shown), as well as from the slope of the Terrace near locality C (pl. XX). Locality E was the one where the tools were first encountered; and since the terrace-sequence had not been worked out at that stage, some tools from lower levels, which more correctly would belong to Terrace 3, also got mixed up. But, as soon as the terrace-sequence became

¹ Owing to lack of time the terraces on the Haripur side could not be studied in detail. It was, however, observed that both Haripur and Guler (railway-station) were located on the same terrace (T3).

² Near the source of the *nullah* the climb is rather steep.

³ The place may also be approached *via* Ghatutar village on Terrace 2.

⁴ Houses belonging to the Ghatutar village also continue down the slope, but it is the ones on the higher level that are situated on Terrace 2.

BANGANGA TERRACES NEAR GULER

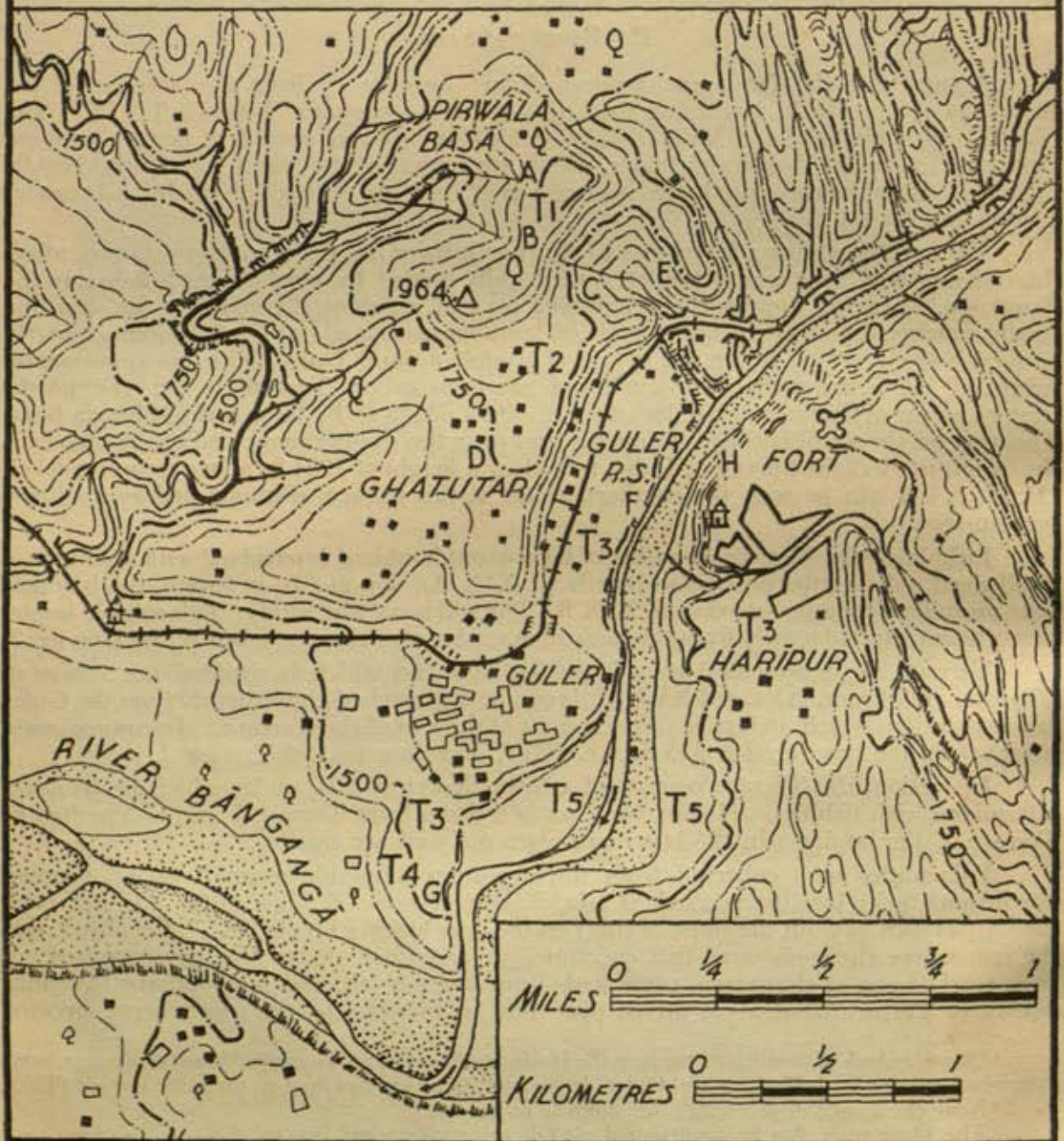


FIG. 2

BANGANGA TERRACES NEAR GULER

SCHEMATIC SECTION

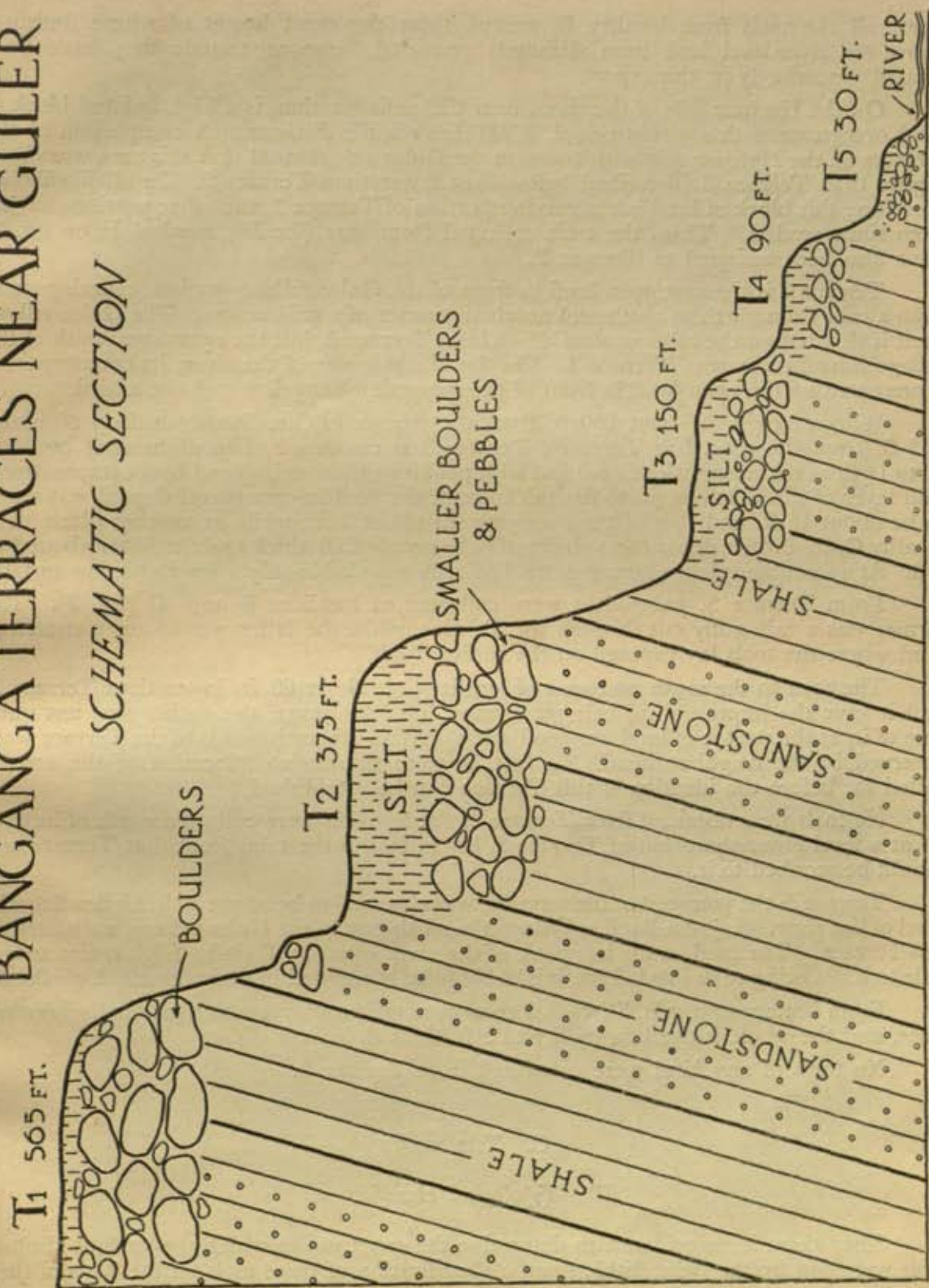


FIG. 3

clear, all the tools from locality E, except those the exact height of whose findspots above the river-level had been definitely recorded, were separated: they have been treated accordingly in this report.

On the Haripur side of the river, near the police-station, is a high isolated block of land overgrown with a *pipal*-tree (pl. XVII, left middle distance). A comparison of the terraces on the Haripur side with those on the Guler side showed that this area was much higher than Terrace 3 (described below) but lower than Terrace 2. In all likelihood, therefore, this block of land is a surviving portion of Terrace 2, the other portions having been since eroded. Thus, the tools collected from here (locality marked H on fig. 2) have also been assigned to Terrace 2.

Terrace 3 is the vast open land in front of the Guler railway-station, covering more than a mile from north to south and nearly a quarter of a mile across. The Guler village itself is situated on the talus washed down from Terrace 2, but the open area south of the village is again a part of Terrace 3. On the Haripur side of the river, its counterpart is represented by the open land in front of the inspection-bungalow and the school.

With a height of about 150 ft. from the river-level (i.e. having a drop of about 225 ft. from the preceding Terrace), Terrace 3 is composed of medium-sized boulders (1 to 1½ ft. in diameter), closely packed with pebbles and superimposed by a comparatively thin layer of silt. At one place the thickness of the boulder-cum-gravel deposit was noted to be about 13 ft. and that of the overlying silt about 2 ft., while at another place, near locality G, the former deposit was observed to be nearly 25 ft. thick and the latter about 3 to 4 ft. At a few other places, however, the bed-rock was visible only a few feet below surface.

From Terrace 3, palaeoliths were collected at localities F and G (fig. 2). The former was a rain-gully cut through the Terrace, while the latter was an open stretch of land where the tools lay exposed on the surface itself.

The area to the south and west of locality G is about 60 ft. lower than Terrace 3, and it gave the impression of being a terrace, T4. However, the author was not quite sure of it, as the stretch of land was too limited and no other remnants of the Terrace were observed in the neighbourhood. In fact, a more thorough exploration of the area is called for before the identity of this Terrace can be established.

No tools were obtained from Terrace 4. A few that were collected south of locality G, at a level lower than that of Terrace 3, lay in fact in the talus from that Terrace and should be ascribed to it.

Terrace 5, the youngest of the terraces, was observed to be about 30 ft. higher than the level of the river. Raja-ka-Bagh, a little to the south-east of the Guler village, is situated on this Terrace. The land on the left bank of the river opposite Raja-ka-Bagh is also assignable to it. Owing to its low height, it is liable to be inundated in exceptionally high floods.

From bottom upwards, Terrace 5 consists of coarse gravel which gradually becomes finer, and the whole is overlain by a 4 to 5 ft. thick deposit of silt.

No tools of any kind were recovered from Terrace 5.

C. THE TOOLS

(i) *Typological classification*

Since there is no evidence to determine the exact use to which the various kinds of tools were put by the palaeolithic man, a classification of these tools on the basis of their



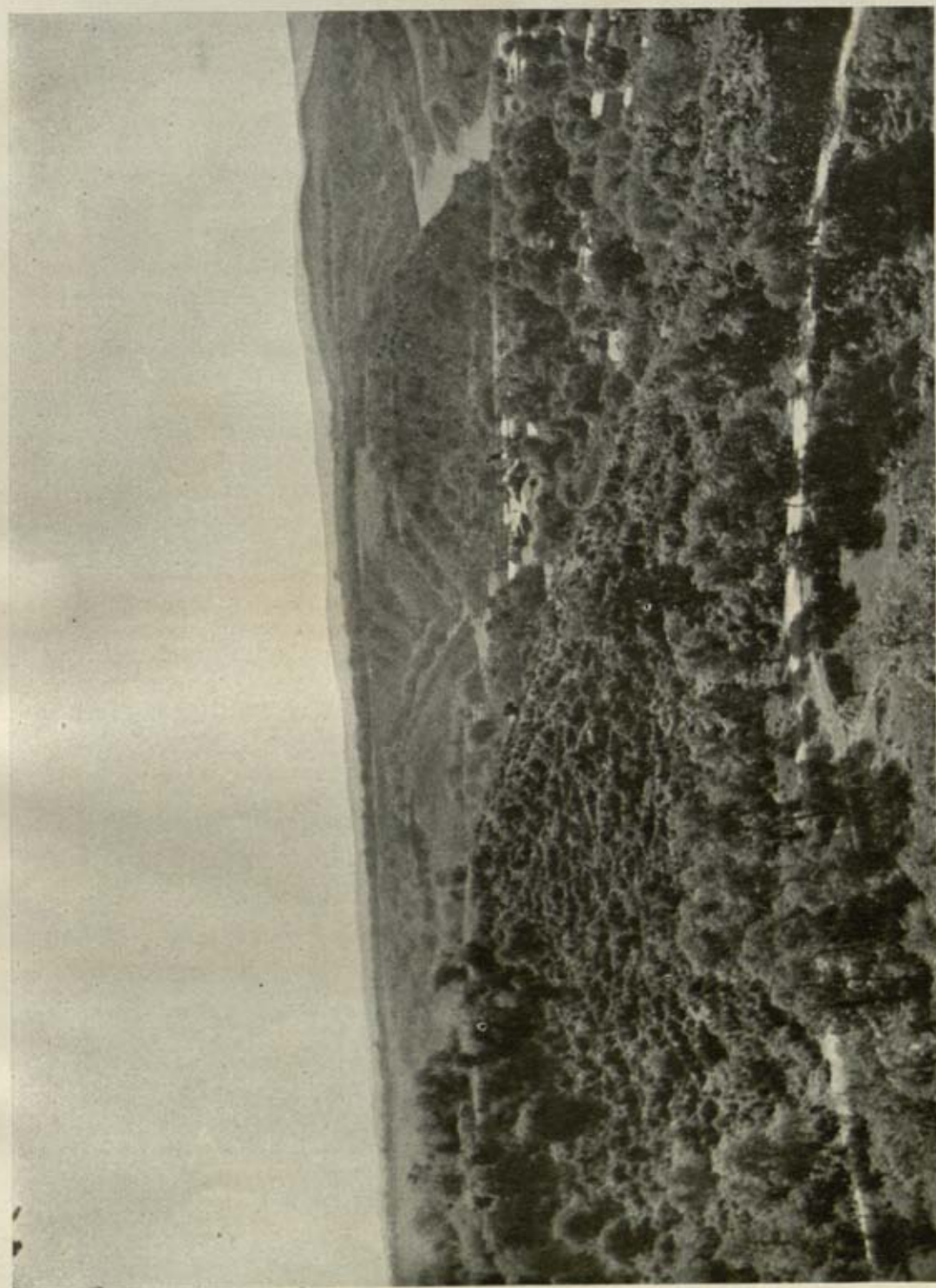
A. A section of Terrace 1 near Guler, showing large-sized boulders intermixed with smaller pebbles and earth. See page 61



B. Close view of a boulder with 'chatter'-marks in Terrace 1 near Guler. See page 61



View showing eroded parts of Terrace 2 near localities C and E, from top of Terrace 1 near Guler. See page 61



Terraces of the Beas and its tributary nullah near Dehra. See page 71



A. View of the implementiferous gravel near Dehra. See page 71



B. View of the Beas near Dehra. See page 71

supposed use is likely to be erroneous. To take, for instance, the well-known type, handaxe: it is difficult to be sure that this kind of tool was used only with the hand (and not by hafting), and it is still more difficult to be sure that it was used as an axe, for its narrowed end suggests that it may have been used more probably for digging out roots etc. than for cutting—a function implied by the use of the term 'axe'. In fact, the 'cleaver' is more akin to the conception of the axe than the handaxe itself. Likewise, such terms as 'chopper', 'chopping-tool', etc., are also open to similar objections, as one cannot be too sure of the functions of these tools. The 'chopper', as Movius himself has stated, may have been used as a 'scraper' as well.¹ Again, the term 'pebble tool' is meant to be applied only to a particular kind of tool, but it has been sometimes used, in its literal sense, for any tool made on pebble.

It would thus be clear that the terminology that we have been using for palaeolithic implements is not based on any definite principle. A term once coined is continued without scrutiny. It is, however, time that scholars working on the subject discussed and decided the issue, so that a uniform nomenclature could be used in future.

For the present, the author has to remain content with the use of the letters of the alphabet for the different types of tools. However, since such a course is rather unconventional, the terms in vogue have also been used alongside.

All the tools collected from Guler are made on pebbles or on flakes struck therefrom. Mainly of fine- to medium-grained quartzite, the pebbles have a variety of shapes—sub-angular, oval, spheroid, etc. In the case of the first two shapes, the pebbles are generally flat-based,² which factor seems to have played an important part in guiding the type of flaking as will be clear from the following. In the case of a spheroid pebble it is essential to take out flakes from both the upper and lower surfaces in order to obtain a sharp cutting-edge. In the case of a flat-based pebble, however, a sharp edge can be obtained by taking flakes merely out of the upper surface. Since at Guler mostly flat-based pebbles were used for the preparation of tools, the prehistoric man obviously found that unifacial flaking was sufficient to obtain a sharp edge. This would perhaps explain to a large extent the predominance of unifacial 'choppers' and the comparative dearth of bifacial 'chopping-tools' at Guler and other allied sites in the Beas and Banganga valleys.

The following typological classification of the tools is proposed.

A: UNIFACIAL 'CHOPPER'.—Under this group are classed tools made mostly on sub-angular or oval pebbles with a flat ventral surface. As a result of the latter feature, the working-edge was obtained by flaking merely a part of the dorsal surface. The group may be divided as follows according to the shape and extent of the working-edge.

Type A i has a working-edge which is straight or nearly so (figs. 4 and 5, 4; pls. XXXIII and XXIV). The butt-end is usually sub-angular and the working-edge is mostly at right angles to the axis from the butt-end to the edge. The flaking is at a high angle, sometimes up to 80°, to the undersurface. Since the edge is not sharp, as compared with that in types A ii and A iii below, it is likely that this type of tools may have been used more suitably for scraping than for cutting.

Type A ii is characterized by a crescentic working-edge, which generally does not extend beyond half the periphery of the pebble (figs. 5, 5 and 6 and 6, 7; pls. XXV and

¹ H. L. Movius (Jr.), 'Early Man and Pleistocene stratigraphy in southern and eastern Asia', *Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University*, XIX, no. 3 (Cambridge, Mass., 1944), p. 41.

² Naturally and not through any kind of splitting.

XXVI A). The butt-end is sub-angular and is always opposite the working-edge. The flaked surface in this case makes a lower angle, sometimes about 45° , with the ventral side than it does in type A i, with the result that a sharper edge is produced. The reverse view of the tool sometimes displays a fine scalloped outline of the edge (fig. 5, 5; pl. XXV A).

Type A iii has a 'fan-shaped' working-edge, which extends even beyond half the periphery of the pebble (figs. 6, 8 and 9 and 7; pls. XXVI B-XXVIII). Another important distinction between types A i and A ii on the one hand and A iii on the other is that, while in the former the butt-end is invariably sub-angular, in the latter one usually holds the tools along a side which may be either curved (in the case of oval pebbles) or roughly straight (in the case of sub-angular pebbles). The angle which the flaked surface makes with the undersurface is usually low, so that a sharp edge is produced. As in the case of type A ii, here also the reverse view of the tool sometimes shows a nice scalloped outline of the edge (fig. 6, 9; pl. XXVII, 9).

Type A iv stands in marked contrast to the above three types; here the pebble used is an elongated quadrangle, and the working-edge is formed by taking out flakes from the two longer and one of the shorter sides, while the other shorter side, remaining unflaked, functions as the butt (fig. 8, 13; pl. XXIX A). The result is that more prominence is gained by the lateral working-edges than by the frontal one. Since only one tool of this type was obtained, one cannot be too sure if it really represents a type: maybe it is just a freak. However, if on further exploration more specimens of this kind are encountered, it would appear that it was both a side- and a front-tool (or perhaps only a side-tool) in contrast to the previously-noted types, which have the working-edge essentially opposite the butt.

B: BIFACIAL 'CHOPPING-TOOL'.—As stated above (p. 65), at Guler and the other sites dealt with in this paper, bifacial flaking was observed mainly in the case of spheroid pebbles. This was a necessity in such pebbles, as otherwise a sharp edge could not be obtained. The flaking is quite often alternate, which results in a wavy working-edge. On the basis of the extent of the working-edge, the group may be subdivided. Thus, *type B i* would have the working-edge limited to a part of the periphery, while in *type B ii* the edge may extend all around (fig. 8, 14; pl. XXIX B).

C: 'PEBBLE HANDAXE'.—This group of tools is usually made on a roughly oval pebble with a flat ventral surface. Flakes are taken out of the dorsal surface from two opposite sides in such a way that a pointed end is produced, which is the distinguishing feature of the type (figs. 8, 15 and 9, 16; pl. XXX). The medial ridge, emerging from the point, runs upwards roughly along the axis of the tool. In the collected specimens the flaking is found confined to a part of the periphery, the remaining part, with its original pebble surface, serving as the butt. As, amongst the pebble tools, this type has a rough resemblance to the handaxe, it has been provisionally called 'pebble handaxe'.

D: HANDAXE.—Under this group come the usual bifacial handaxes, with their surfaces, both lower and upper, flaked and finished. Their subdivisions are already well-known, and one need not go into details: it would suffice to say that the Abbevillian and Acheulian types have been respectively called in this paper types D i and D ii. Further subdivisions, following the early, middle and late types of the Abbevillian and Acheulian handaxes, have not been considered necessary in the present context, since, in all, two specimens, one each of types D i and D ii, were found (fig. 9, 17 and 18; pl. XXXI). Even these specimens are not absolutely definite, as they are rolled and bear thermal fractures.

E: CORES.—The cores from Guler are generally discoidal in shape (*type E i*) (fig. 10; pls. XXXII and XXXIII A), although elongated or other sub-angular forms (*type E ii*) also occur. They are worked bifacially, the flaking usually running along the entire periphery. However, in many cases only one side is fully flaked, while the other retains a good part

of the cortex. The flaking is quite often alternate with the result that a wavy edge is produced. Since a few specimens have edges with marks of utilization, it is likely that they were used as tools. This, however, cannot be affirmed unless more examples of the kind are obtained.

F: FLAKES.—The flakes (figs. 11 and 12; pls. XXXIII B-XXXVI A) are divisible into four types. Under *type F i* are placed Clactonian flakes without any retouch. The angle between the platform, which is usually the pebble cortex itself, and the flake-surface is always high, say about 120° . *Type F ii* includes Clactonian flakes with the edge partly retouched and showing marks of utilization. *Types F iii* and *F iv* comprise proto-Levalloisean flakes. Of them, *type F iii* is roughly oval in outline and has edges retouched, sometimes considerably, showing that at least some of the specimens were used as tools; *type F iv* is elongated and roughly quadrangular in outline and has definite marks of secondary retouch on the edges which are sharp enough to indicate use.

(ii) *Terraces and the tool-sequence*

During the short exploration fifty-two palaeolithic artefacts were collected, six from Terrace 1, eighteen from Terrace 2 and ten from Terrace 3. The remaining eighteen were collected at a time when the terrace-sequence had not been studied and thus they got mixed up. However, their provenance (neighbourhood of locality E) indicates that very likely they include specimens from Terraces 2 and 3. Chances are that a majority of them belonged to Terrace 2, but in view of the mixing up nothing can be said with certainty.

The material from Terrace 1 included: three unifacial 'choppers', one each of types A i, A ii, and A iii; one bifacial 'chopping tool' of type B ii; and two Clactonian flakes, one without and other with the retouching of the edge (types F i and F ii respectively). A general comparison of these tools with those from Terraces 2 and 3 shows that they are more crude and patinated. The fine scalloped outline of the cutting-edge found in the choppers from Terrace 2 is remarkably absent in the specimens from Terrace 1. One of the flakes is singularly large—about 9 in. across, with a prominent bulb and high angle (fig. 11, 22; pl. XXXIII B), the like of which has not been obtained from any of the subsequent terraces. This shows that the development of the tools was towards finer and somewhat smaller ones with the passage of time.

From the typological point of view, one notes the absence of the handaxe in Terrace 1: in fact, not even a 'pebble handaxe' occurs. Similarly, the proto-Levalloisean flake is absent.

Terrace 2 yielded: six 'choppers', two each of types A i, A ii and A iii; one 'chopping-tool' of type B i; one 'pebble handaxe' of type C; one core of type E ii; six Clactonian flakes, four without and two with retouch, respectively of types F i and F ii; and three proto-Levalloisean flakes, of which two belong to type F iii and one to type F iv.

Some of these specimens show signs of patination, and one of them is even rolled. The remaining ones are, however, comparatively fresh. This difference may perhaps be explained by an assumption that, while most of the tools are contemporary with the formation of the Terrace itself, some of them may have originally belonged to the earlier Terrace, from where they were washed down and redeposited.

Technologically, the tools from Terrace 2 are finer and better manufactured than those from Terrace 1. The edges of the 'choppers' are sharp and well-defined and show marks of secondary retouch. Typologically, one notes the presence of the 'pebble handaxe', as well as of proto-Levalloisean flakes, in addition to the types occurring in the preceding Terrace.

Of the eighteen specimens which may have belonged partly to Terrace 2 and partly to Terrace 3, the classification is as follows: eight unifacial 'choppers', of which one each belongs to types A i, A ii and A iv and five to type A iii; one bifacial 'chopping-tool' of type B i; one 'pebble handaxe' of type C; two handaxes, one each of types D i and D ii; three discoidal cores of type E i; two Clactonian flakes, one each without and with retouch (types F i and F ii respectively); and one proto-Levalloisean flake of type F iv.

But for a few specimens which show signs of patination, the tools under this group are mostly fresh. From the typological point of view, many an item deserves special attention. Amongst the 'choppers', the 'fan-shaped' type, A iii, predominates, while a new type, A iv, with lateral working-edges, comes into being. Discoidal cores, some of them with fine alternate flaking and even the retouching of the edge, are met with for the first time. A neat specimen of the 'pebble handaxe' is encountered. However, the most important point is the presence of two handaxes, one each of the Abbevillian and Acheulian type (see, however, p. 66). An outstanding type of the 'Madras' industry, the handaxe is uncommon for the Guler region.

The artefacts from Terrace 3 include: seven unifacial 'choppers', two each of types A ii and A iii and three of type A i; one core of type E ii; and two Clactonian flakes, one each without and with retouch (types F i and F ii respectively). Amongst these specimens two are patinated, of which one is rolled indicating that it originally belonged one of the preceding terraces and was subsequently washed down and redeposited in Terrace 3. Typologically, there is nothing remarkable about the material. It has, however, to be

DISTRIBUTION OF TOOL-TYPES AT GULER

Terrace	Type	Unifacial 'chopper' with straight working-edge	Unifacial 'chopper' with crescentic working-edge	Unifacial 'chopper' with 'fan-shaped' working-edge	Unifacial 'chopper' with lateral working-edge	Bifacial 'chopping-tool' with part of periphery worked	Bifacial 'chopping-tool' with entire periphery worked	'Pebble handaxe'	Abbevillian handaxe(?)	Acheulian handaxe(?)	Discoidal core	Non-discoidal core	Clactonian flake without retouch	Clactonian flake with retouch	Proto-Levalloisean flake, oval	Proto-Levalloisean flake, longish	Total
		A i	A ii	A iii	A iv	B i	B ii	C	D i	D ii	E i	E ii	F i	F ii	F iii	F iv	
Terrace 3	...	3	2	2	...	...	...	...	...	...	...	1	1	1	...	...	10
Terraces 3 and 2 (mixed)		1	1	5	1	1	...	1	1	1	3	...	1	1	...	1	18
Terrace 2	...	2	2	2	...	1	...	1	...	...	...	1	4	2	2	1	18
Terrace 1	...	1	1	1	...	...	1	...	...	...	...	...	1	1	...	...	6
Total	...	7	6	10	1	2	1	2	1	1	3	2	7	5	2	2	52

remembered that some of the tools in the mixed collection dealt with in the preceding paragraphs may have also belonged to Terrace 3.

The table (p. 68) gives an idea at a glance of the tools with reference to the terrace-sequence.

(iii) *Description of illustrated specimens* (figs. 4-11; pls. XXIII-XXXVI A)¹

Out of the fifty-two specimens collected from Guler, twenty-seven are illustrated here. They are arranged typewise and, within each type, according to the terrace-sequence.

1. Unifacial 'chopper' with a roughly straight cutting-edge and an angular butt: type A i. Both the ventral and dorsal surfaces are nearly flat. The scar on the ventral surface is a later one. Patinated. From locality B; Terrace 1.

2. Unifacial 'chopper' with a roughly straight cutting-edge and an angular butt: type A i. Both the ventral and dorsal surfaces of the pebble are nearly flat. The angle which the flaked surface makes with the ventral is fairly high, about 75°. From locality C; Terrace 2.

3. Unifacial 'chopper' with an oblique cutting-edge and an angular butt: type A i. The dorsal surface of the pebble is a little more flat than the ventral. From locality D; Terrace 2.

4. Unifacial 'chopper' with a roughly straight cutting-edge and a sub-angular butt: type A i. Both the ventral and dorsal surfaces of the pebble are flat. The angle between the flaked and ventral surfaces is fairly high, about 80°. From a gully near locality E; Terrace 2 or 3.

5. Unifacial 'chopper' with a crescentic cutting-edge and a sub-angular butt: type A ii. Both the ventral and dorsal sides are fairly flat. Particular attention may be drawn to the scalloped outline of the edge. From locality E; Terrace 2.

6. Unifacial 'chopper' with a crescentic cutting-edge and an angular butt: type A ii. The pebble is flat with an irregular outline. The edge has definite marks of secondary retouch. From locality G; Terrace 3.

7. Unifacial 'chopper' with a crescentic cutting-edge which covers nearly half the outline of the pebble and an angular butt: type A ii. The ventral side is convex and the dorsal comparatively flat. From locality G; Terrace 3.

8. Unifacial 'chopper' with a 'fan-shaped' cutting-edge which covers more than half the periphery of the pebble: type A iii. The tool is held not at a sub-angular end as the foregoing specimens but along a side which is slightly curved. The ventral surface is flat, while the dorsal slopes down towards the edge. Patinated. From locality A; Terrace 1.

9. Unifacial 'chopper' with a 'fan-shaped' cutting-edge and a curved side functioning as butt: type A iii. One may note the neat, scalloped outline of the edge. From locality E; Terrace 2.

10. Unifacial 'chopper' with a curved side functioning as butt. Though the cutting-edge is not 'fan-shaped', as in the foregoing ones, yet it has a rough approach towards that shape, particularly in contrast to type A i and A ii: hence the tool has been placed under type A iii. The angle which the flaked surface makes with the ventral is low, near about 50°. Patinated. From locality E; Terrace 2.

¹The illustrations show respectively the dorsal, side and ventral views of the tools.

²As compared with the crescentic or 'fan-shaped' cutting-edges of types A ii and A iii respectively.

11. Unifacial 'chopper' with a 'fan-shaped' cutting-edge and a side functioning as butt: type A iii. Both the ventral and dorsal surfaces are flat and the angle between the flaked and ventral surfaces is low, about 50°. From a gully near locality E; Terrace 2 or 3.

12. Unifacial 'chopper' with a 'fan-shaped' cutting-edge: type A iii. Though the pebble is sub-angular, it is a side and not the sub-angular end that functions as butt. The ventral surface is flat, but the dorsal surface is uneven with a pronounced hump near the centre. Consequently the flaking is very steep, the angle between the flaked and ventral surfaces being about 75°. From a gully near locality E; Terrace 2 or 3.

13. Unifacial 'chopper' with lateral cutting-edges: type A iv. Since this is the only specimen of its kind, one cannot say if it represents a regular type or is just a freak. From a gully near locality E; Terrace 2 or 3.

14. Bifacial 'chopping-tool' made on a roughly spheroid pebble: type B ii. The flaking runs practically along the entire periphery. Patinated. From locality B; Terrace 1.

15. 'Pebble handaxe': type C. The specimen is a rolled one, but the features, particularly the pointed end and the flaking directed from two sides, are clearly discernible. From locality E; Terrace 2.

16. 'Pebble handaxe': type C. This is a well-preserved specimen. The ventral surface is flat, while the dorsal one shows a little hump towards the centre. Out of the latter surface, flakes have been removed from two opposite sides in such a way as to produce a pointed working-end, which bears clear marks of secondary retouch. A prominent medial ridge runs from the pointed end to the central hump. From a gully near locality E; Terrace 2 or 3.

17. Handaxe': type D i. With its crude flaking and rough finish, it is assignable to the Abbevillian stage. While the edge shown in illustration 'b' is jagged due to alternate flaking, the one in 'd' seems to be merely the result of a thermal fracture. The surface shown in 'c' is considerably pitted, and one is at a loss to visualize the original outline and finish of the tool. From a gully near locality E; Terrace 2 or 3.

18. Handaxe': type D ii. One of its sides (illustration 'a') has a smooth surface. The outline is more shapely than in the preceding specimen. Thus, the tool may be placed under the Acheulian category. However, the edge and side, illustrated in 'b' and 'c' respectively, show more of thermal than real flake-scars. Since the tool is partly rolled and worn out, it is difficult, as in no. 17, to reconstruct the original surface, particularly of the side shown in 'c'. From a gully near locality E; Terrace 2 or 3.

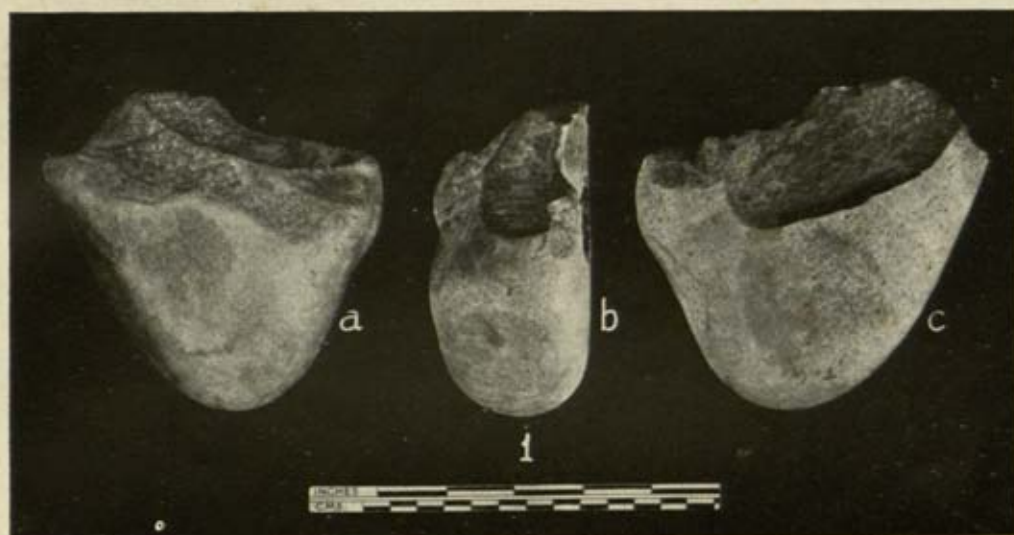
19. Discoidal core: type E i. Flakes have been removed from one side fully and from the other side (shown in illustration 'a') only partially, leaving a good part of the cortex. The flake-scars are bold and deep. As a result of alternate flaking, a sinuous edge has been produced, which also shows some batter-marks indicating that the specimen may perhaps have been used as a tool. From a gully near locality E; Terrace 2 or 3.

20. Discoidal core: type E i. This specimen also is fully flaked on one side but only partly on the other, the cortex bearing prominent 'chatter'-marks. The flake-scars are large and deep. From a gully near locality E; Terrace 2 or 3.

21. Discoidal core: type E i. This is a specimen smaller than the preceding ones. The flake-scars are, however, deep and prominent. The side shown in 'c' retains the original cortex except for a single flake-scar. From a gully near locality E; Terrace 2 or 3.

22. Clactonian flake: type F i. Struck from a boulder rather than from a pebble, the flake is large-sized, nearly 9 in. across. The bulb of percussion is very prominent as

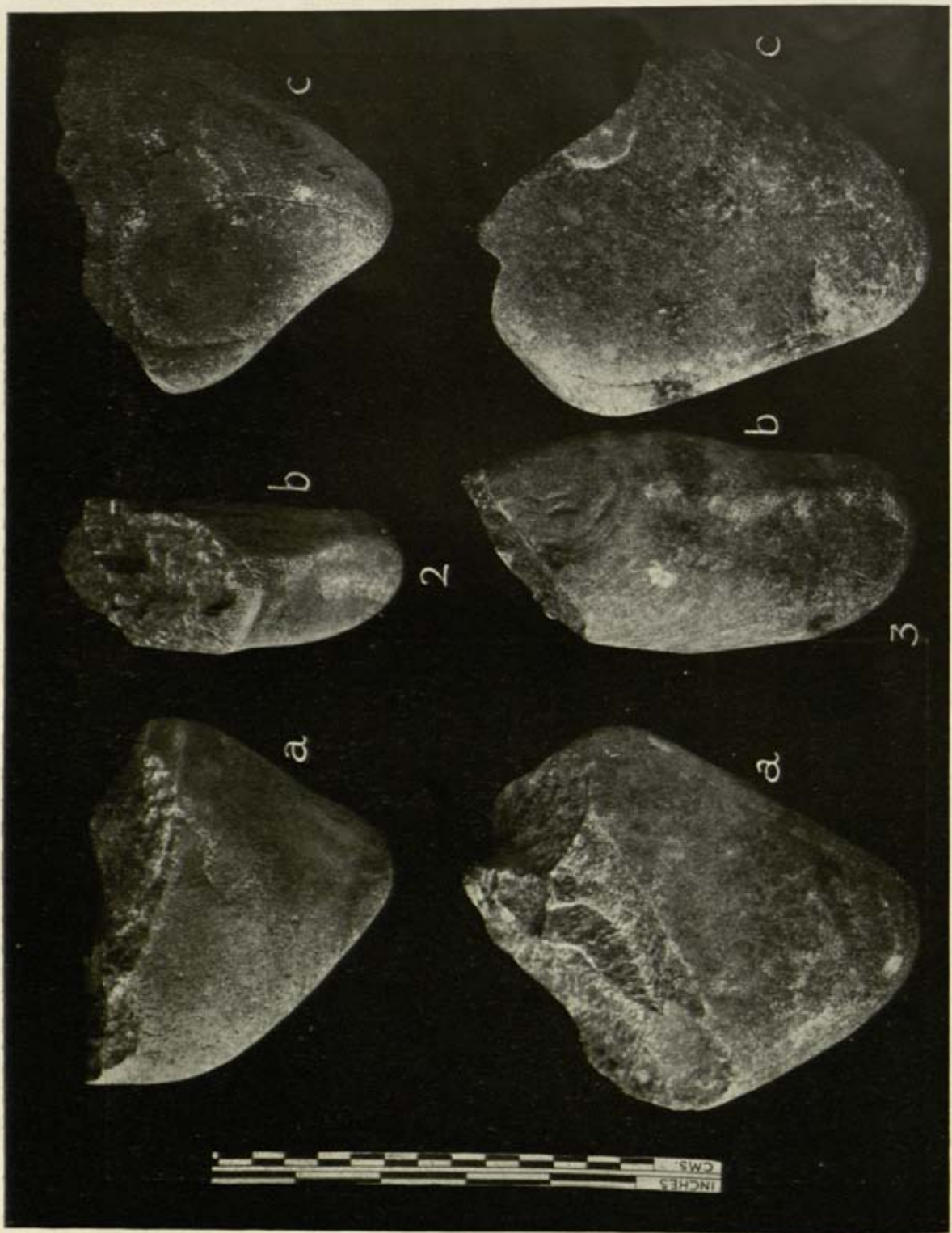
¹ See, however, p. 66.



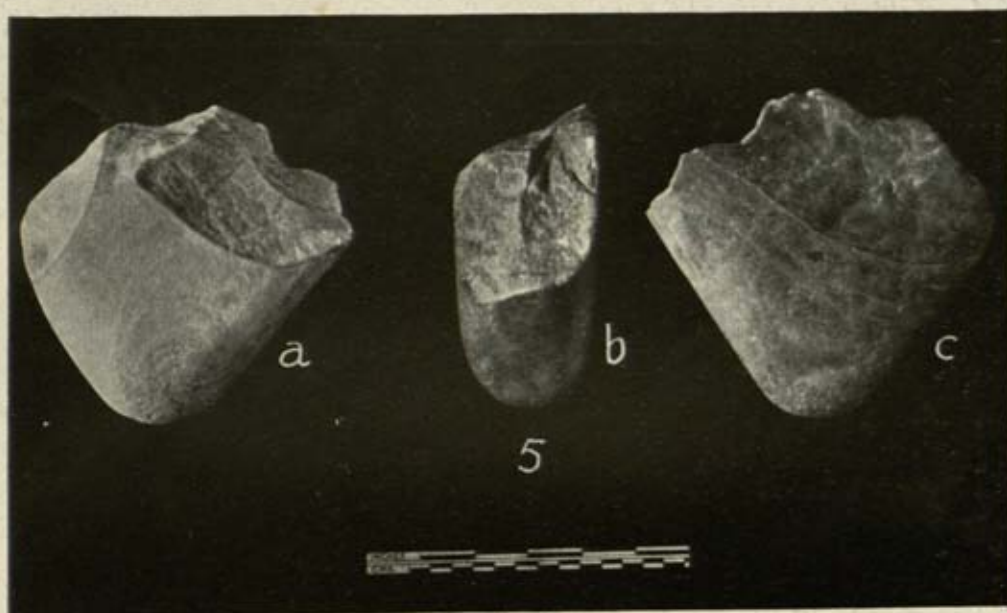
A. Guler: unifacial 'chopper', type A i, from Terrace 1. See page 69



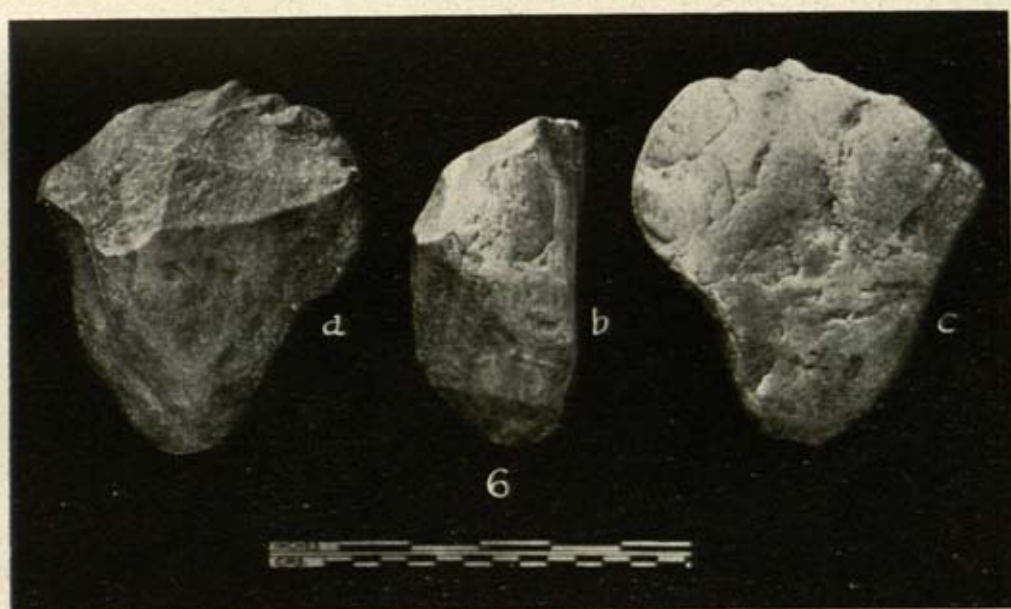
B. Guler: unifacial 'chopper', type A i, from Terrace 2 or 3. See page 69



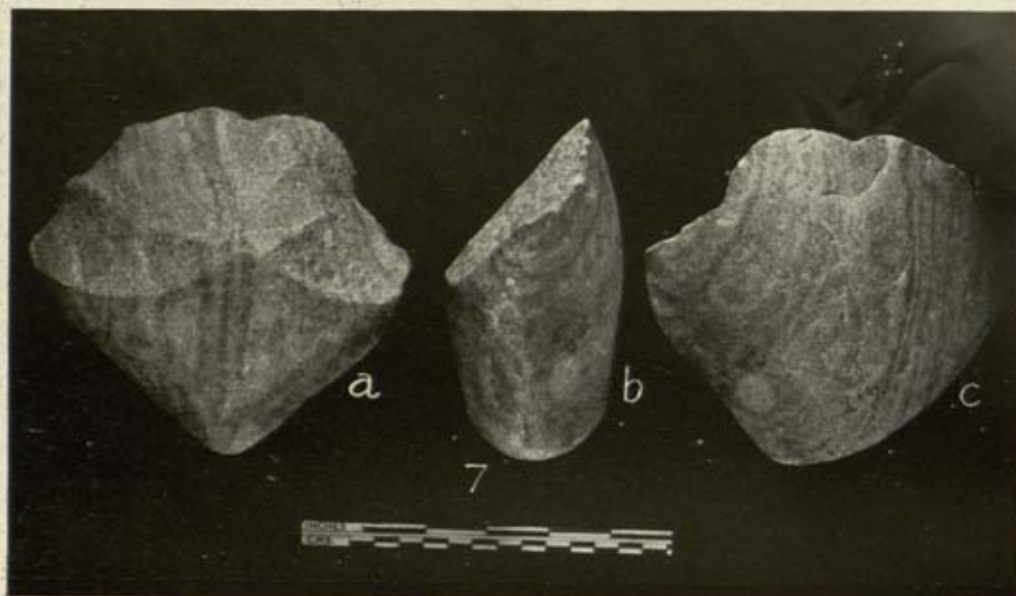
Guler: unifacial 'choppers', type A i, from Terrace 2. See page 69



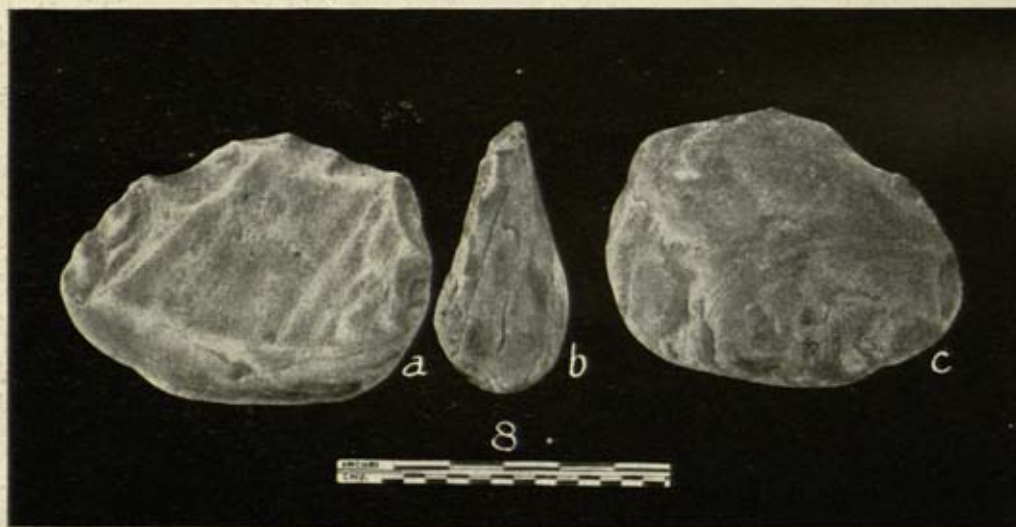
A. Guler: unifacial 'chopper', type A ii, from Terrace 2. See page 69



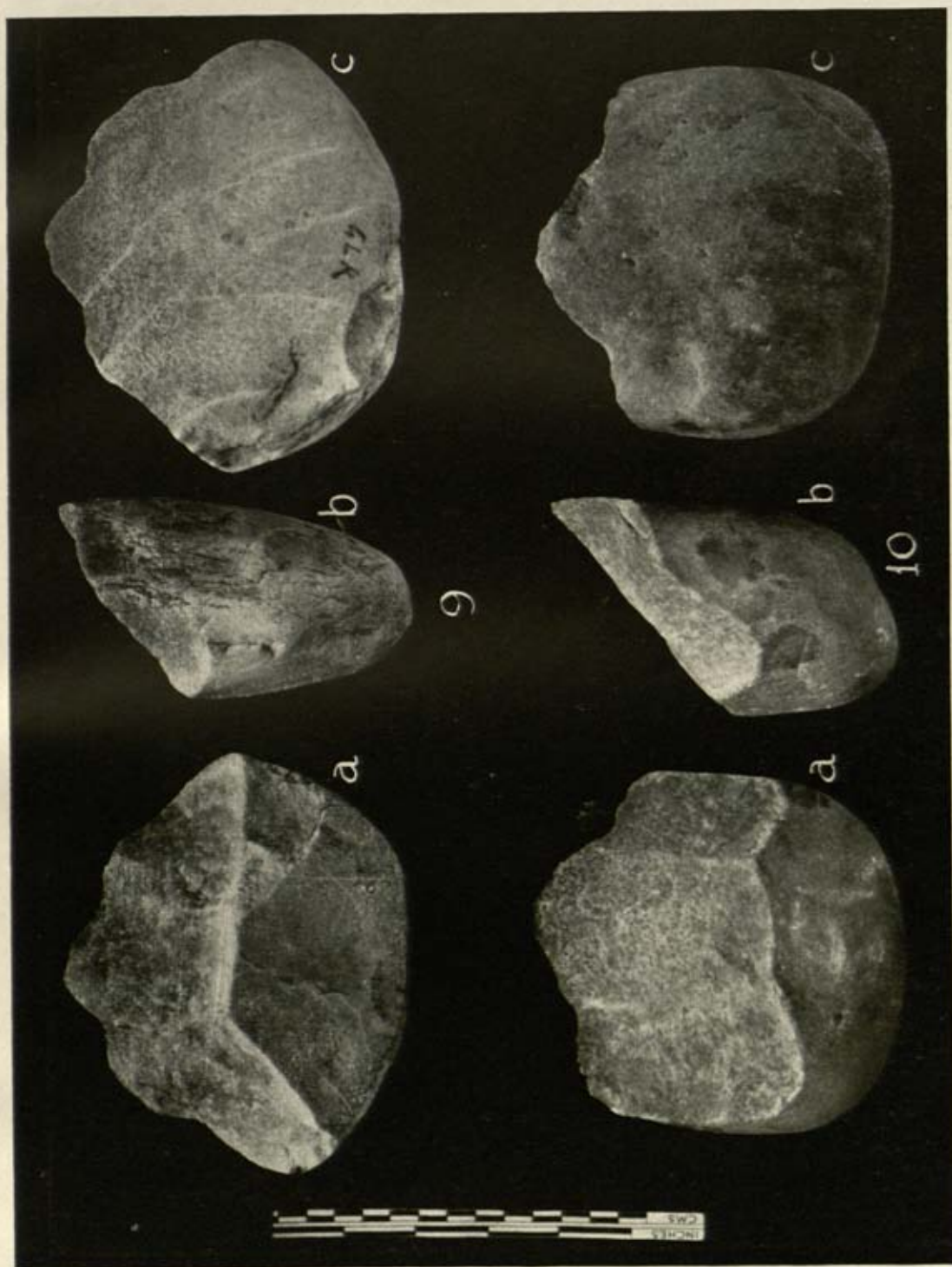
B. Guler: unifacial 'chopper', type A ii, from Terrace 3. See page 69



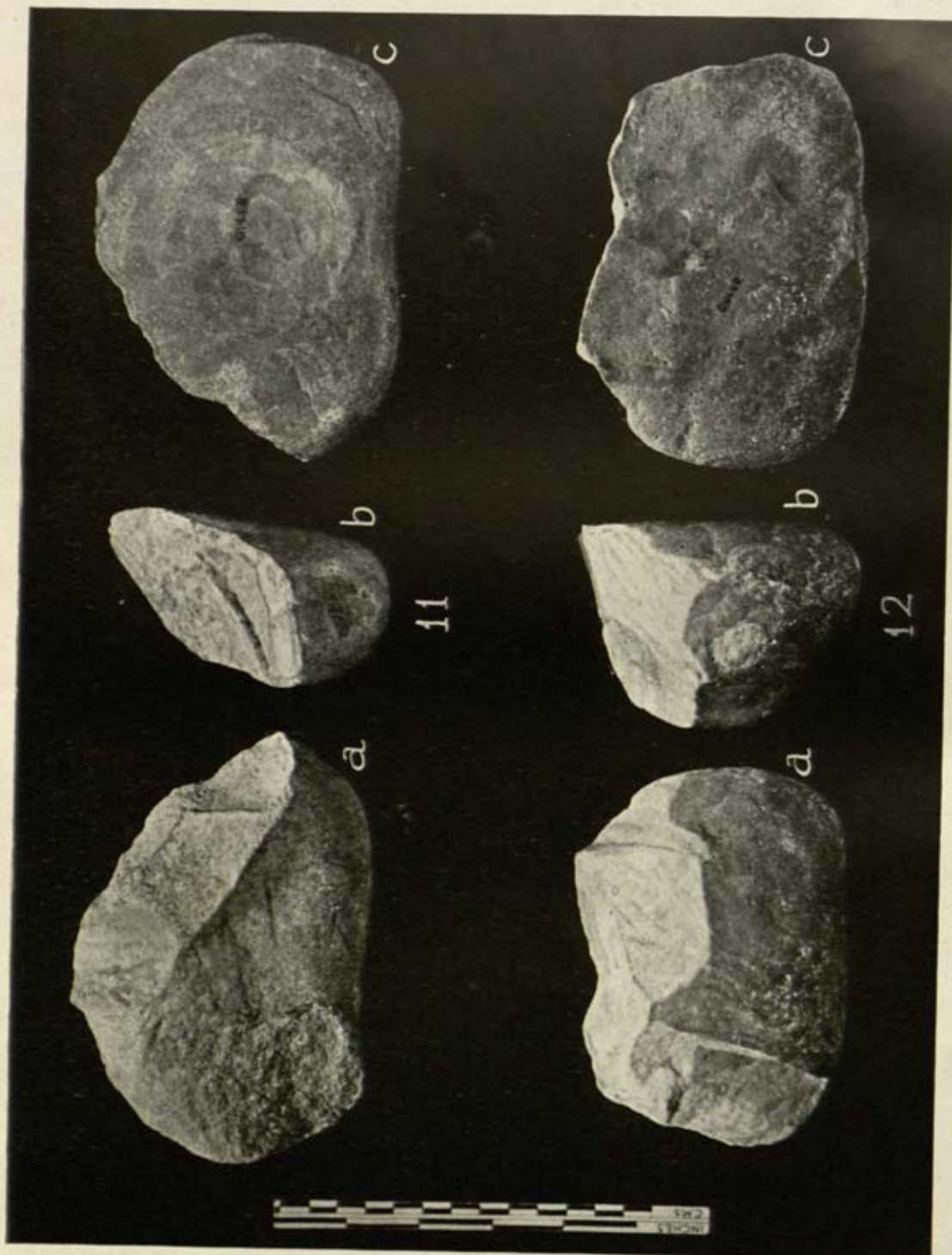
A. Guler: unifacial 'chopper', type A ii, from Terrace 3. See page 69



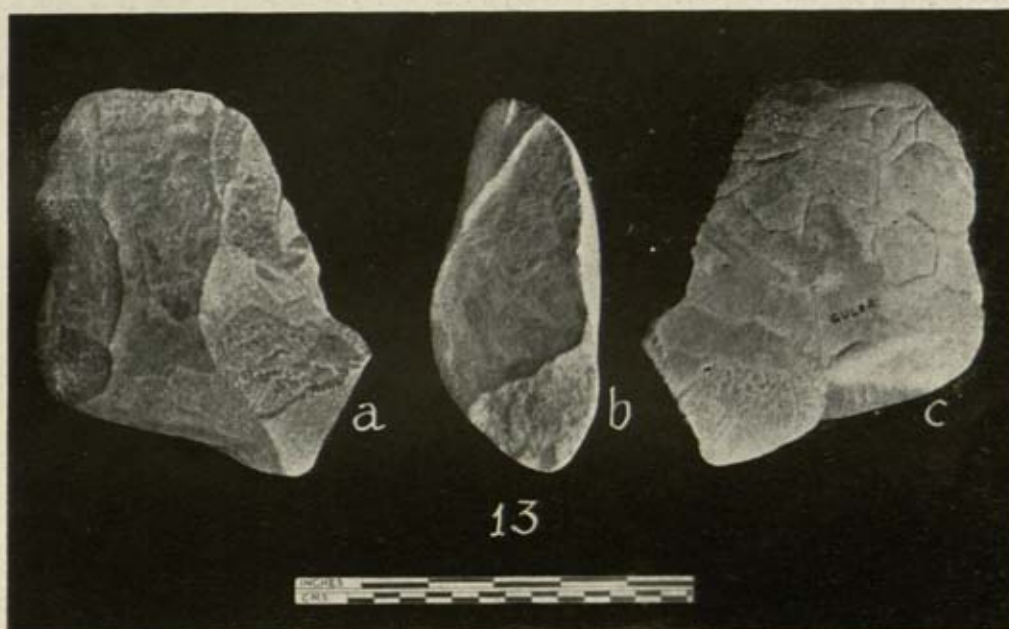
B. Guler: unifacial 'chopper', type A iii, from Terrace 1. See page 69



Guler: unifacial 'chopper', type A iii, from Terrace 2. See page 69



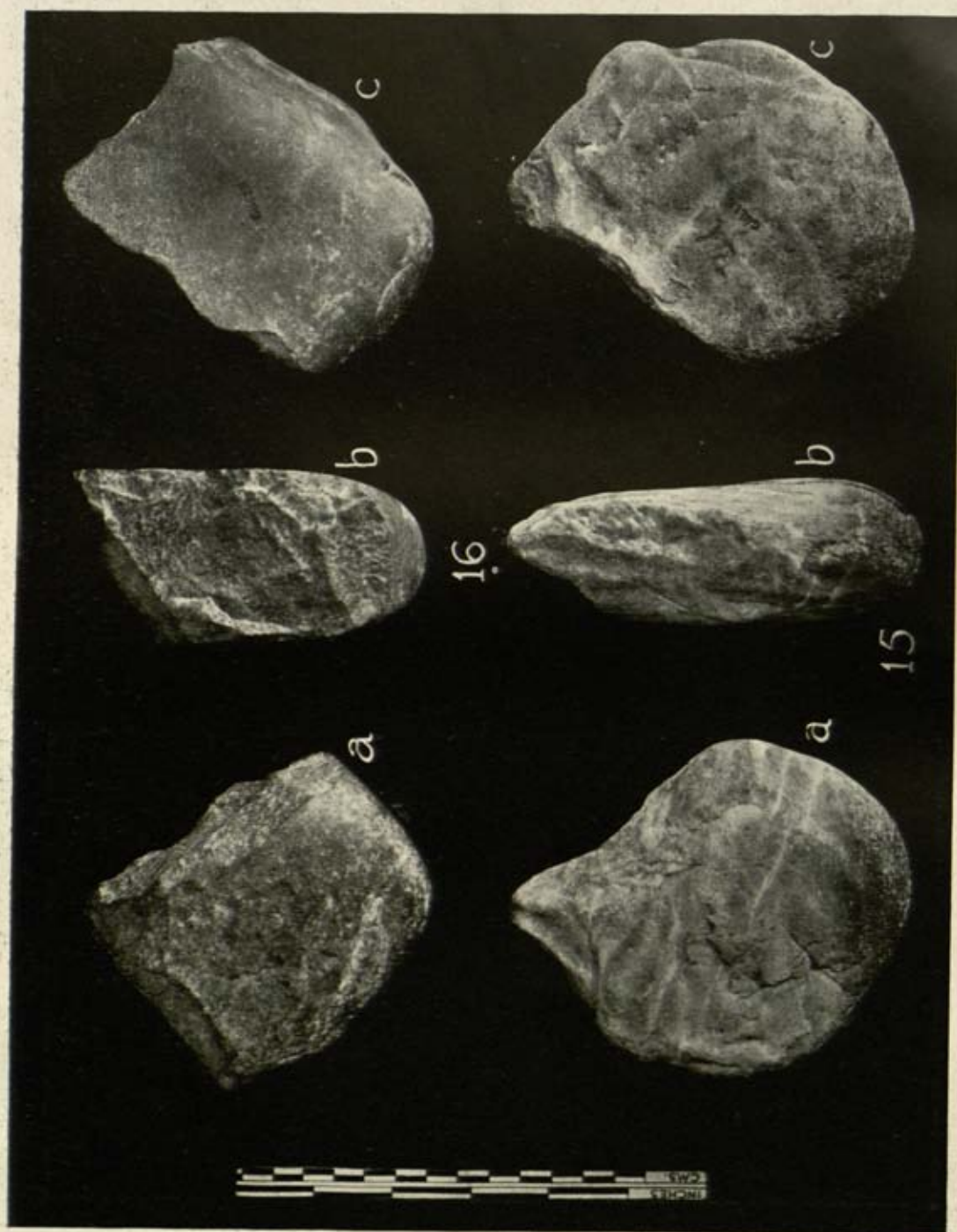
Guler: unifacial 'choppers', type A iii, from Terrace 2 or 3. See page 70



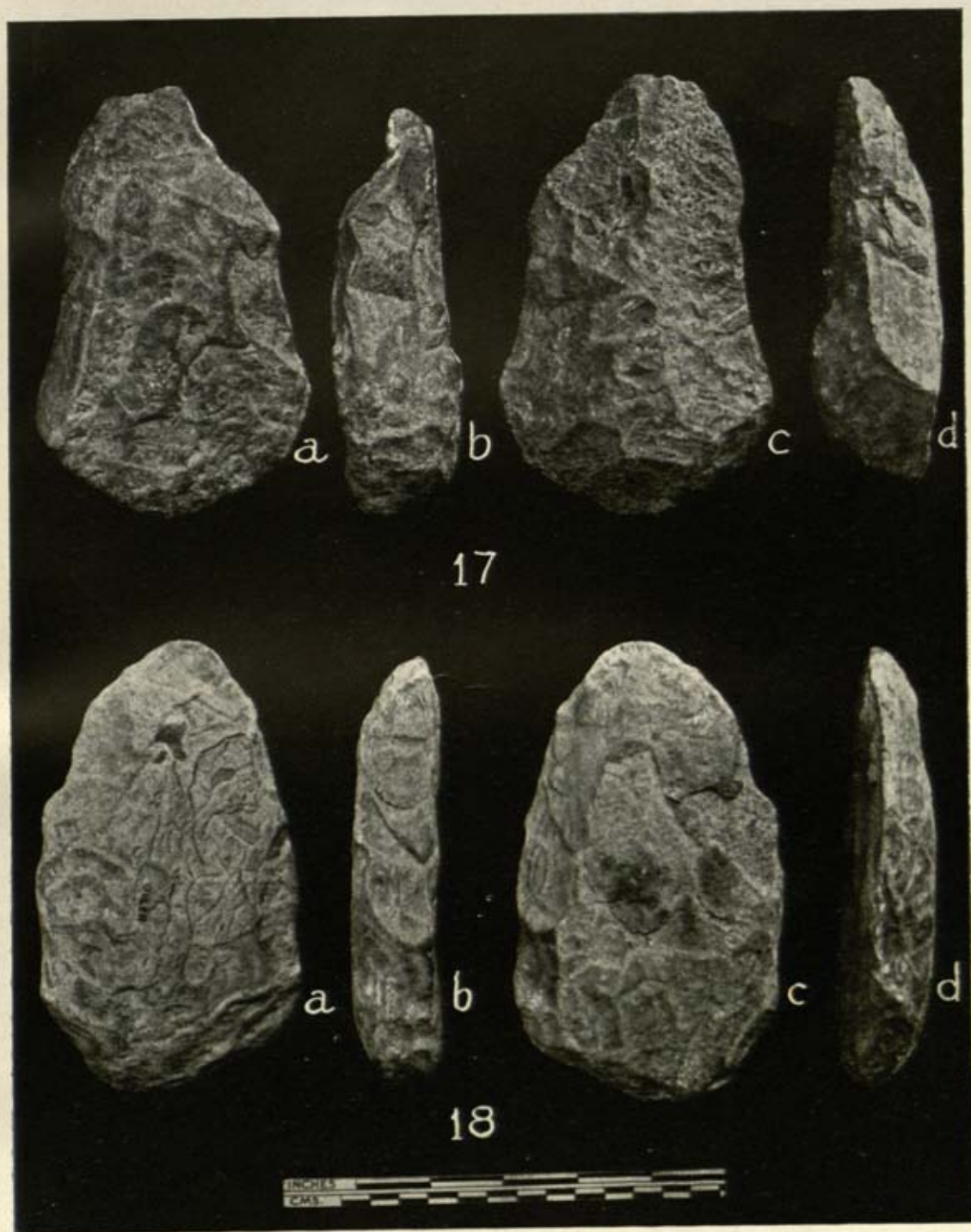
A. Guler: unifacial 'chopper', type A iv, from Terrace 2 or 3. See page 70



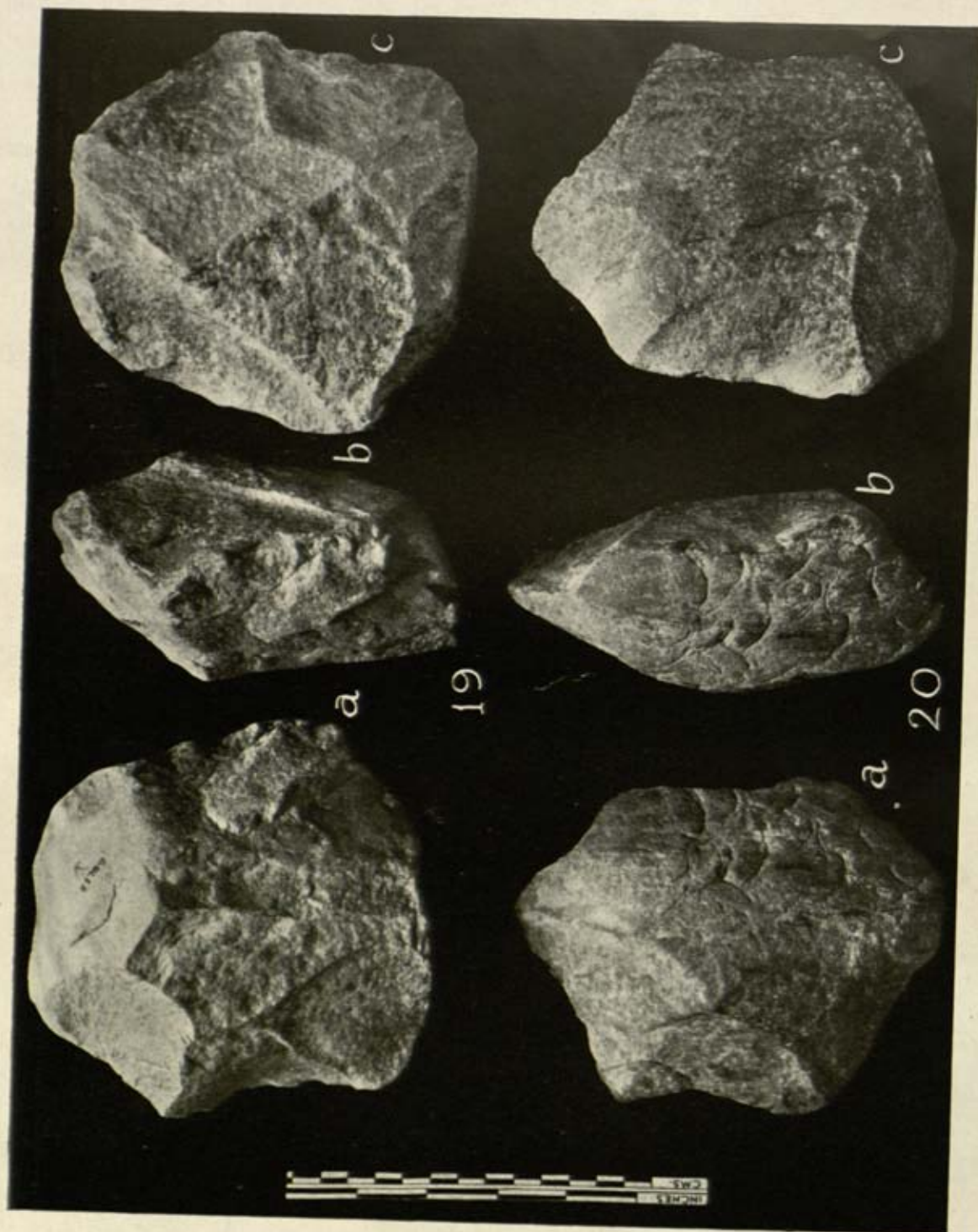
B. Guler: bifacial 'chopping-tool', type B ii, from Terrace 1. See page 70



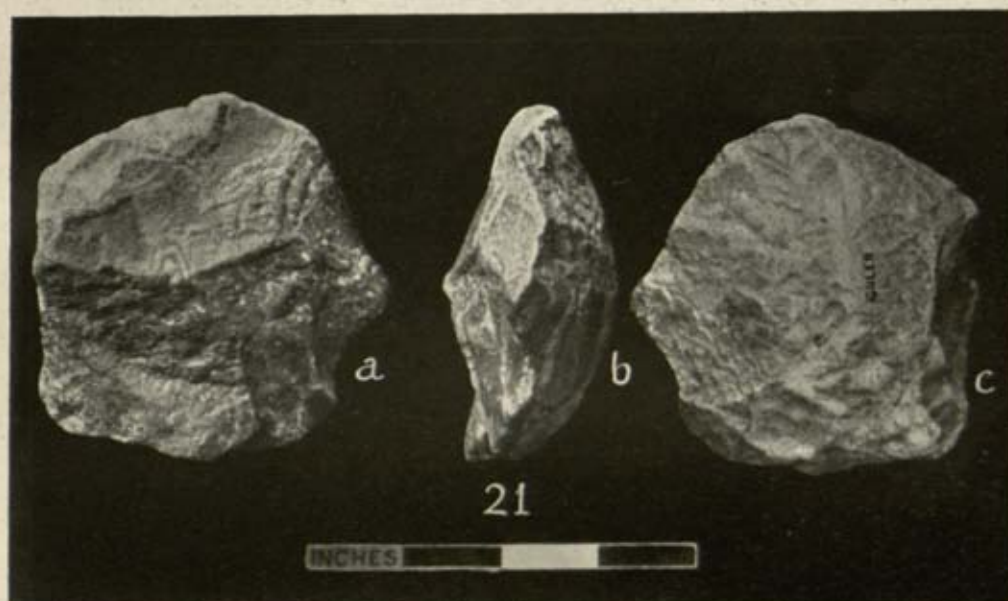
Guler: 'pebble handaxes', type C; 15, from Terrace 2, and 16, from Terrace 2 or 3. See page 70



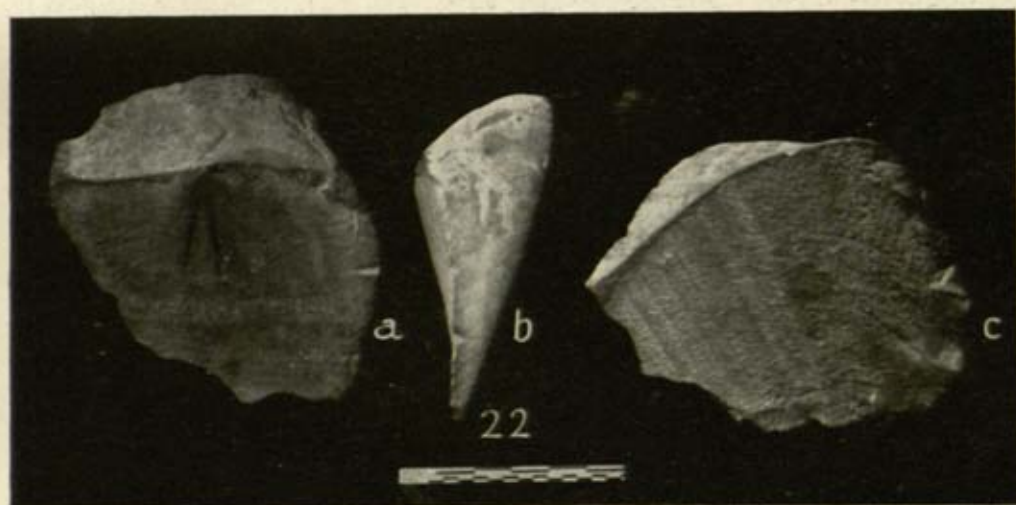
Guler: handaxes, 17, type D i, and 18, type D ii, both from Terrace 2 or 3. See page 70



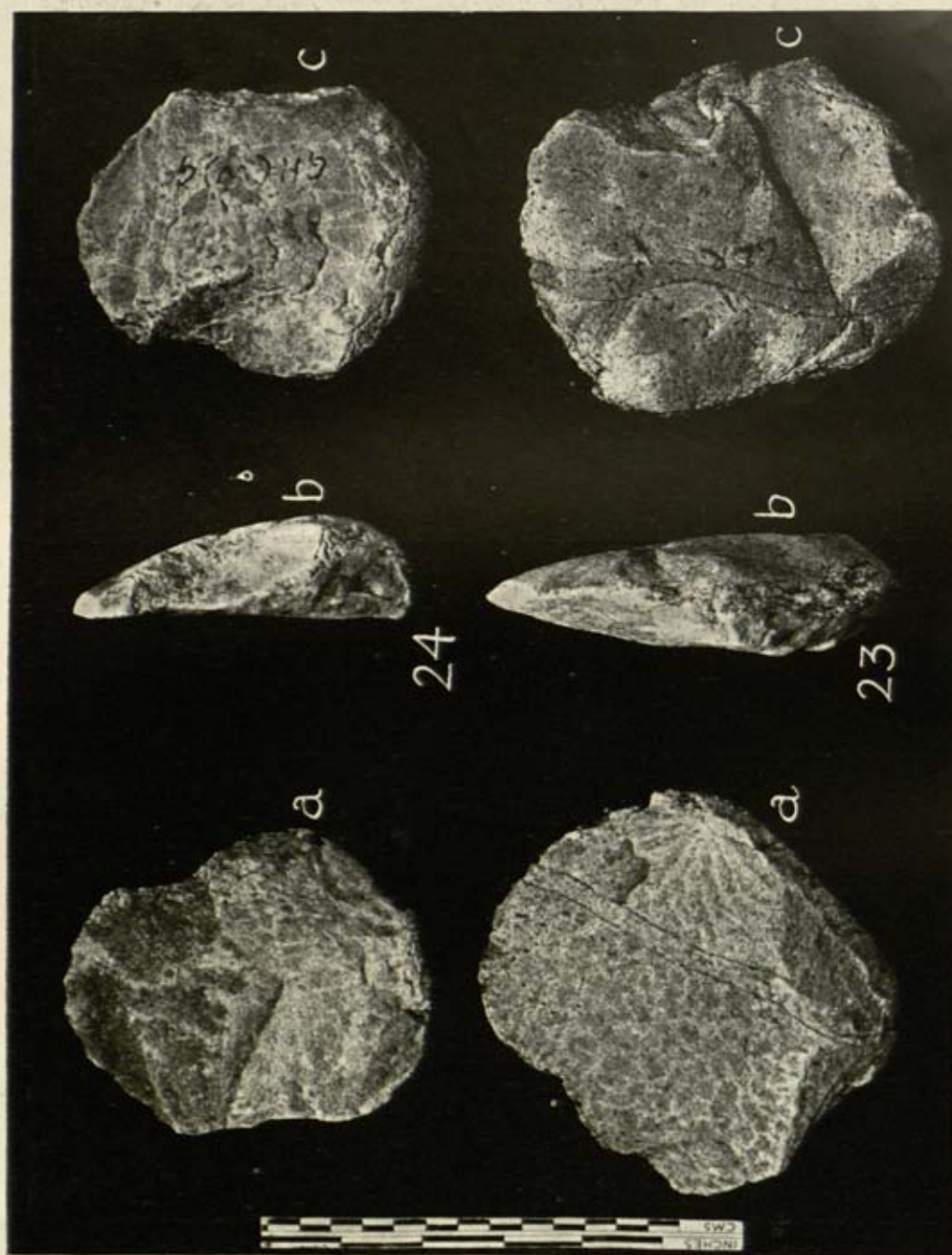
Guler: discoidal cores, type E i, from Terrace 2 or 3. See page 70



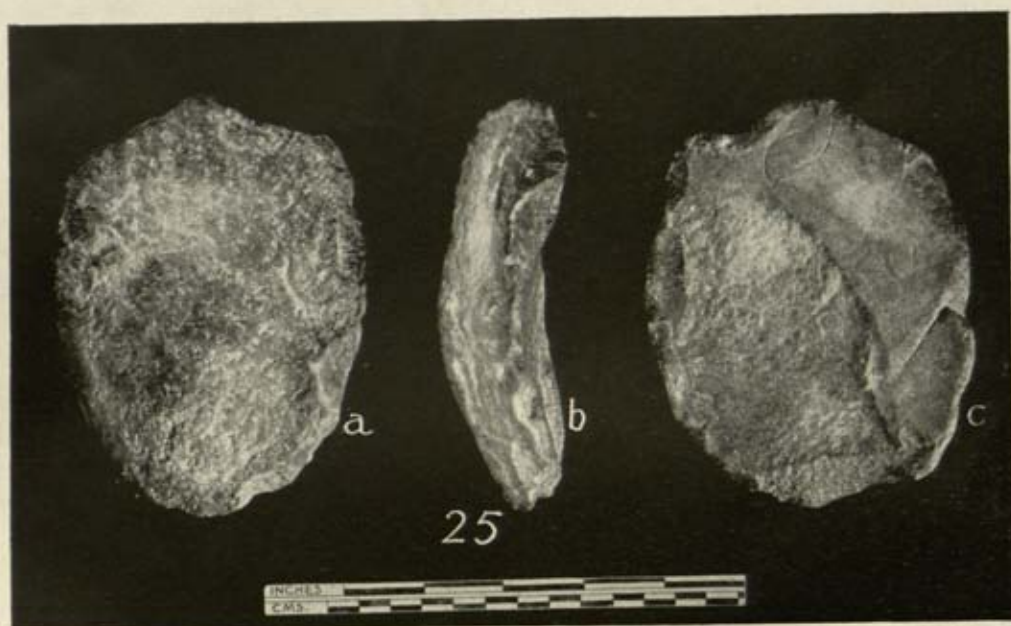
A. Guler: discoidal core, type E i, from Terrace 2 or 3. See page 70



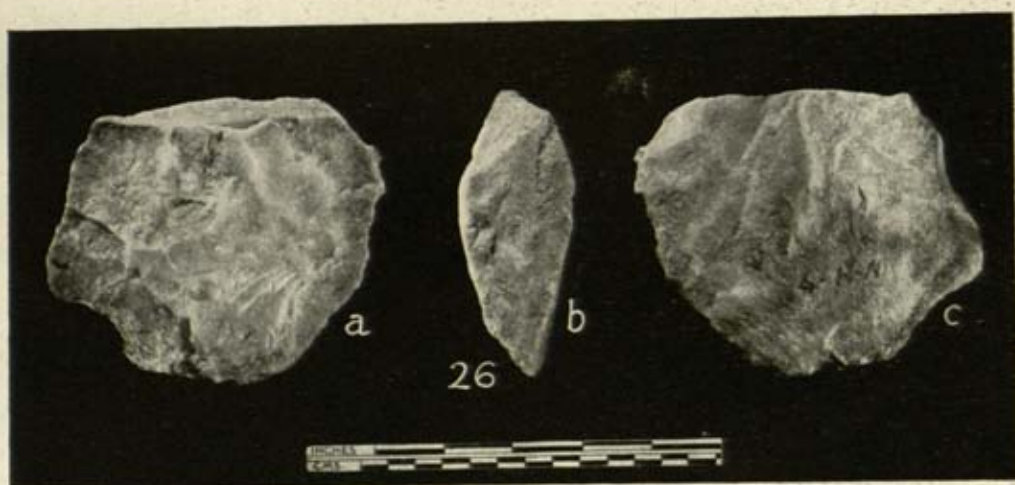
B. Guler: Clactonian flake, type F i, from Terrace 1. See page 70



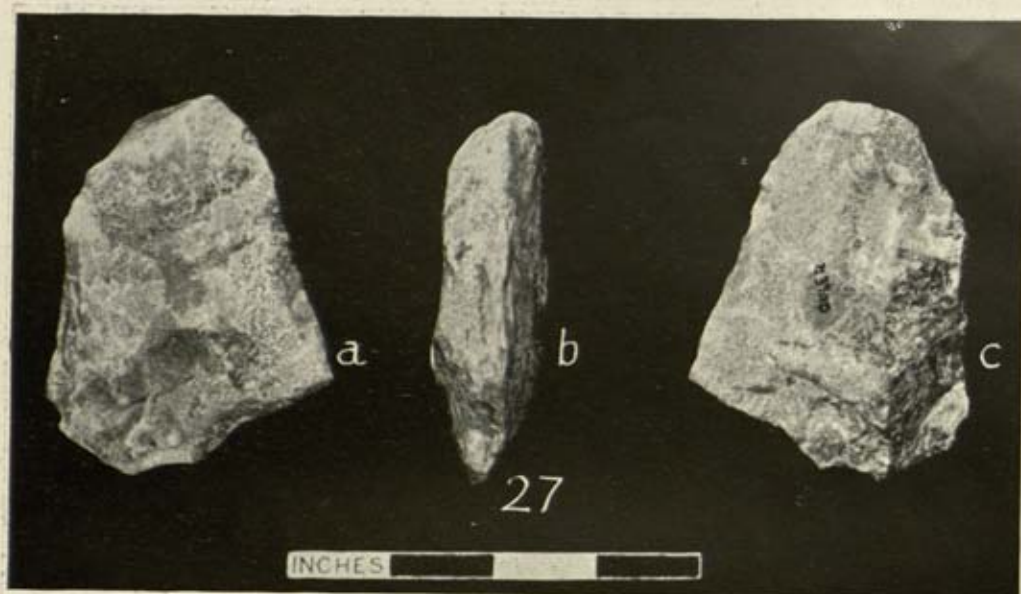
Guler: Clactonian flakes, 23, type F i, and 24, type F ii, both from Terrace 2. See page 71



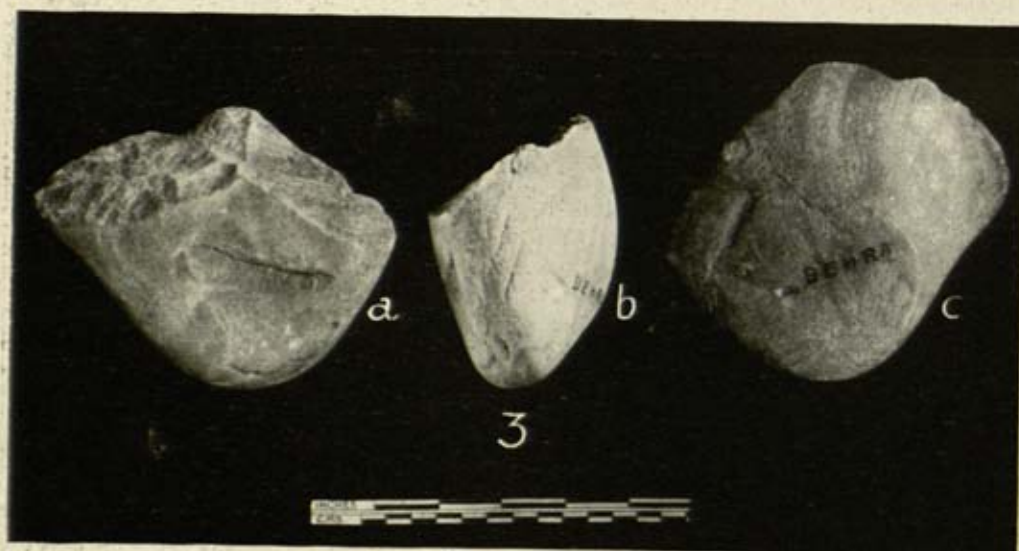
A. Guler: proto-Levalloisean flake, type F iii, from Terrace 2. See page 71



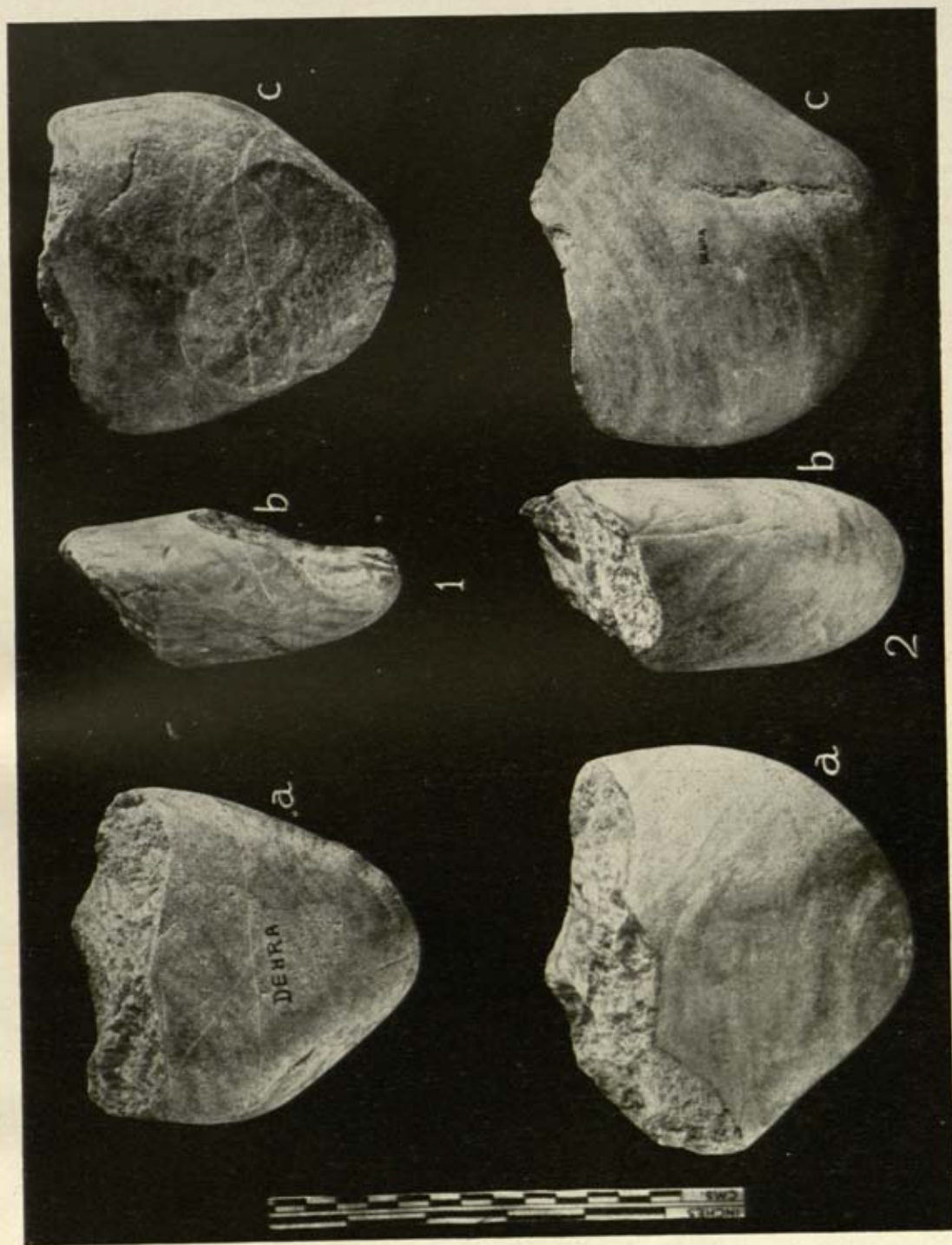
B. Guler: proto-Levalloisean flake, type F iii, from Terrace 2. See page 71



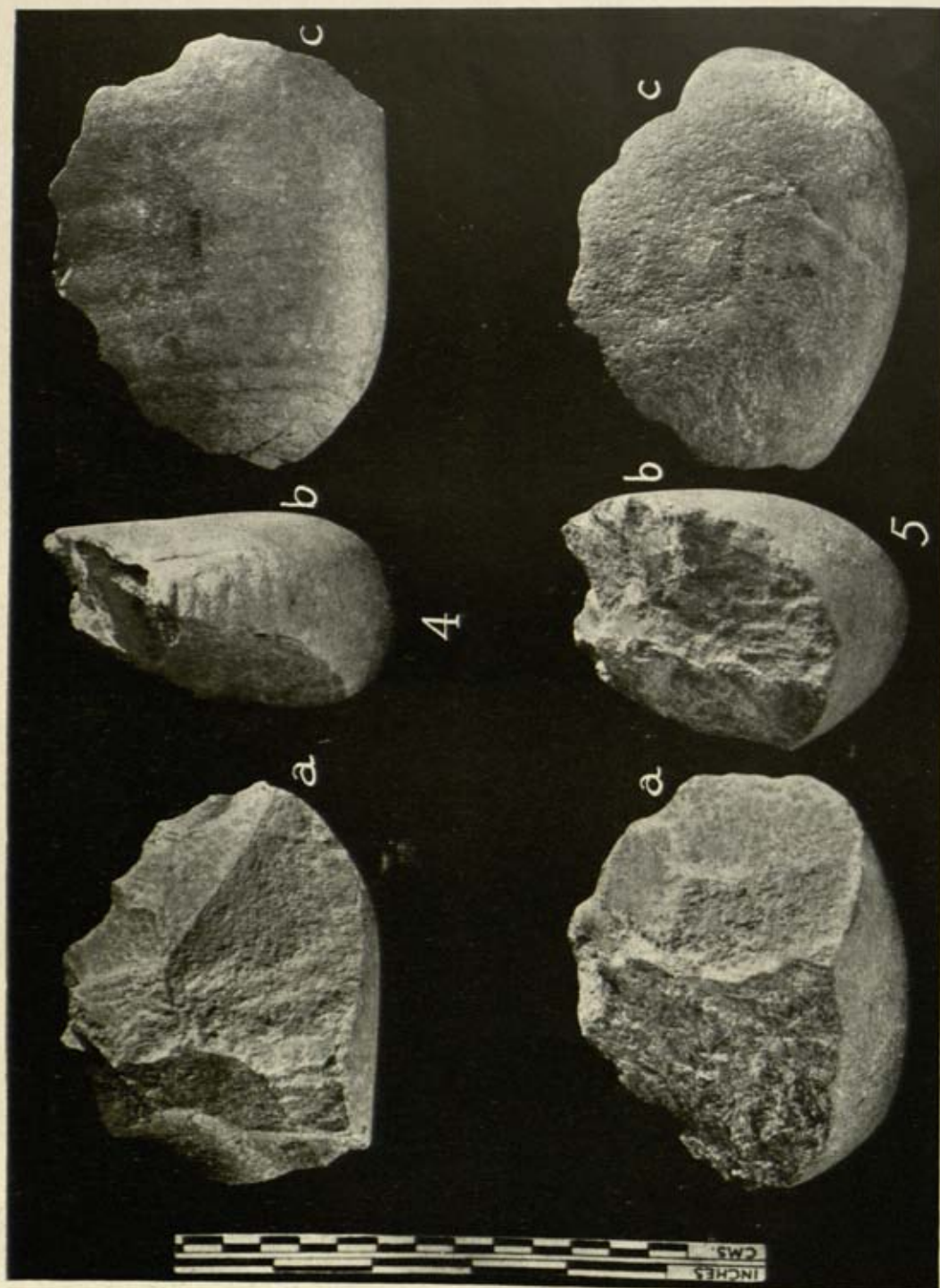
A. Guler: *proto-Levalloisian flake, type F iv, from Terrace 2 or 3. See page 71*



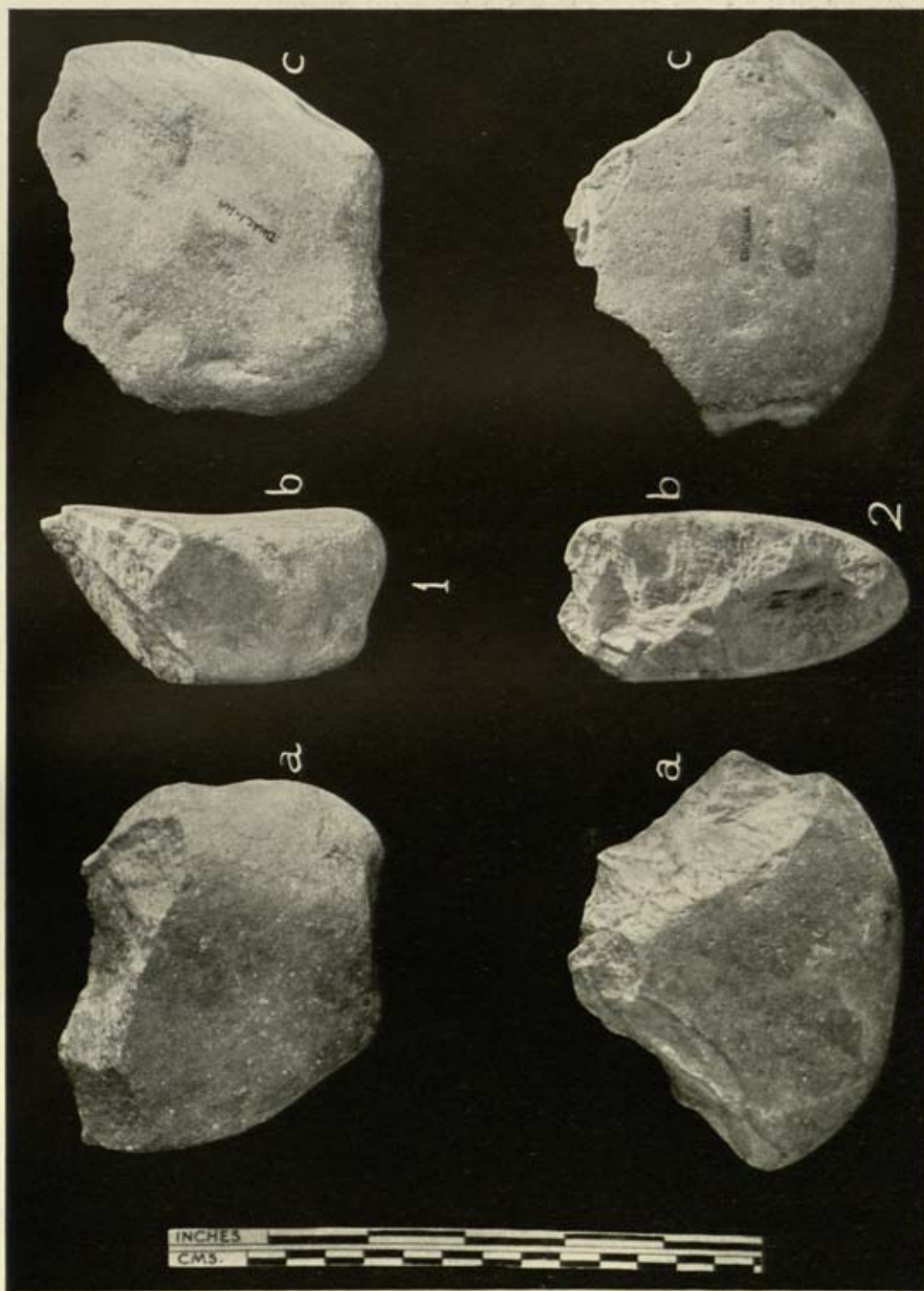
B. Dehra: *unifacial 'chopper', type A ii. See page 81*



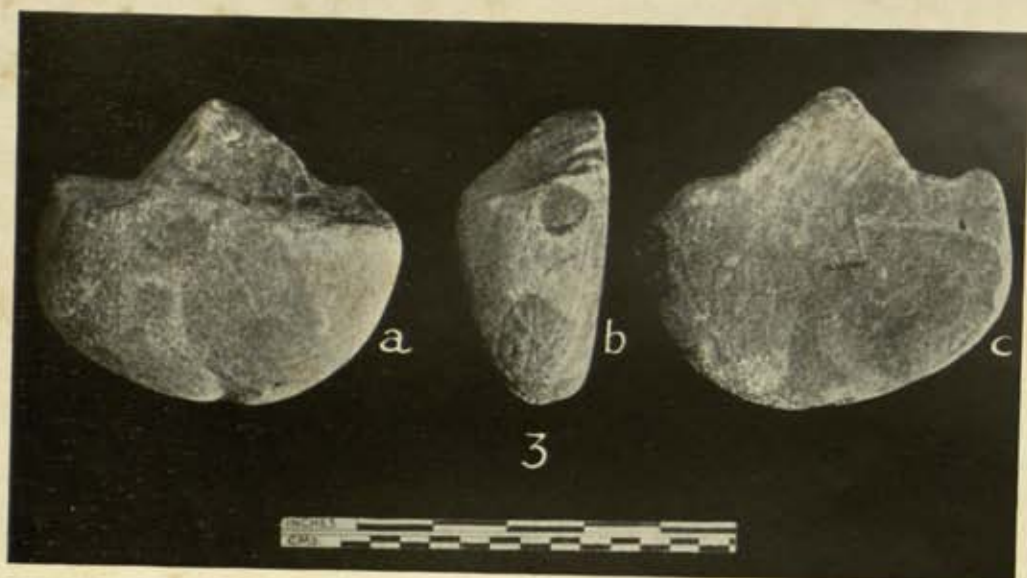
Dehra: unifacial 'choppers', type A i. See page 81



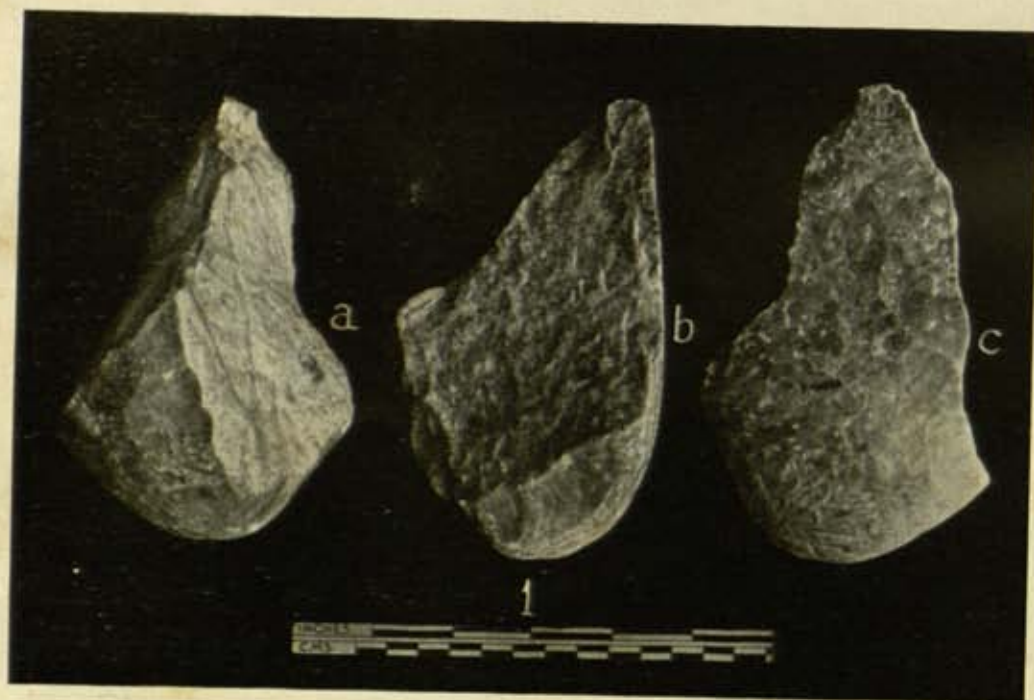
Deltra: unifacial 'chopper', type A iii. See page 81



Dholiara: unifacial 'choppers', 1, type A i, and 2, type A i. See pages 81 and 85



A. Dhaliara: 'pebble handaxe', type C. See page 85



B. Kangra: 'pebble handaxe', type C. See page 85

also are the radial lines. The angle between the flake-surface and the platform, which is the cortex itself, is about 120° . Though there is no secondary retouch, the edge bears some batter-marks suggesting that the specimen may have been used as a tool. From locality A; Terrace 1.

23. Clactonian flake: type F i. The non-flaked side retains the original cortex. From locality E; Terrace 2.

24. Clactonian flake; type F ii. Its edges are partly retouched. The non-flaked side retains the original cortex. From locality C; Terrace 2.

25. Proto-Levalloisean flake: type F iii. Roughly oval in outline, it has partly-retouched edges. From locality H; Terrace 2.

26. Proto-Levalloisean flake: type F iii. A part of the specimen is broken, perhaps through thermal action. There are traces of secondary working along the edge. Thus, the specimen is likely to have been used as a tool, maybe as a scraper. From locality D; Terrace 2.

27. Proto-Levalloisean flake: type F iv. It is an oblong flake as against nos. 25 and 26, which are roughly oval. One of the edges (the right one in illustration 'a') is finely retouched, indicating that it may have been used as a side-scraper. Retouching is also noticed along the edge shown downwards in the illustration. From a gully near locality E; Terrace 2 or 3.

3. DEHRA

A. THE SITE

About 24 miles south-south-east of Kangra, where the Kangra-Hoshiarpur road crosses the Beas, is located the little township of Dehra ($31^{\circ} 53' N.$ Lat. and $76^{\circ} 14' E.$ Long.). It is approachable from either Kangra or Hoshiarpur, there being a bus-service between these places. While the construction of a bridge over the Beas is on the programme of the Government, at present the river has to be ferried across (pl. XXII B). The place has got an inspection-bungalow.

B. RIVER-TERRACES

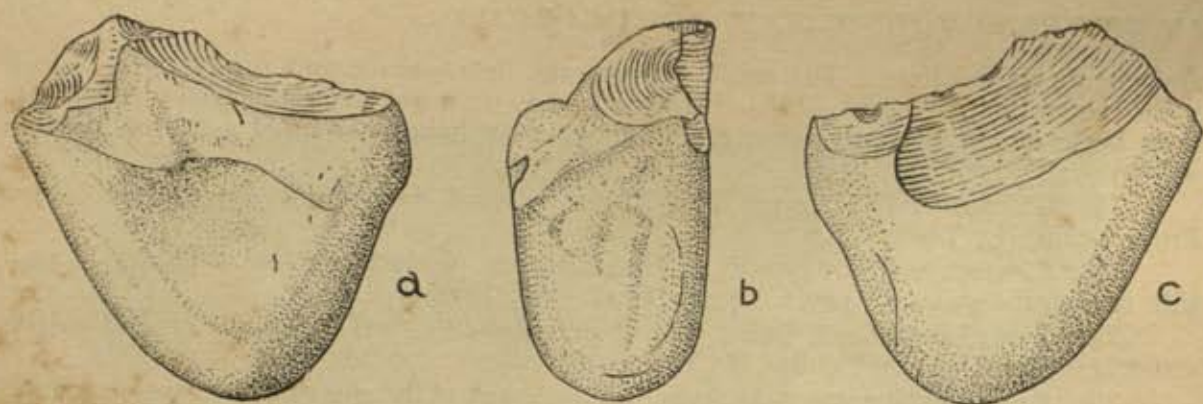
Flowing through the Siwaliks, the Beas has cut many a terrace, of which four could be identified in the vicinity of Dehra Gopipur (pl. XXI) within the course of a day that the author was there. Owing to lack of time no systematic survey on the lines of Guler could be carried out at Dehra. However, the few observations made may be recorded here.

The town of Dehra stands on a terrace, which is about 115 ft. above the level of the river. The police-station with the bazar in front may be treated as the central point for this terrace. As one moves along the road towards Kangra, about a furlong from the police-station, one comes to the foot of a terrace which rises to a considerable height, maybe over 200 ft. (not measured) from the level of the Dehra town. Palaeoliths were discovered from a thick gravel-bed constituting a part of this terrace (pl. XXII A).

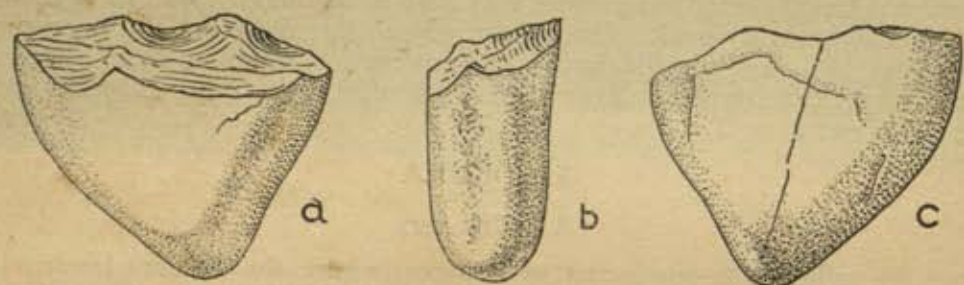
On the Gopipur side of the river was noticed a terrace which appeared to be higher than the one just described. However, as the time at disposal was very limited, the height, extent, etc., of these terraces could not be worked out.

C. THE TOOLS (figs. 13 and 14, 4 and 5; pls. XXXVI B-XXXVIII)

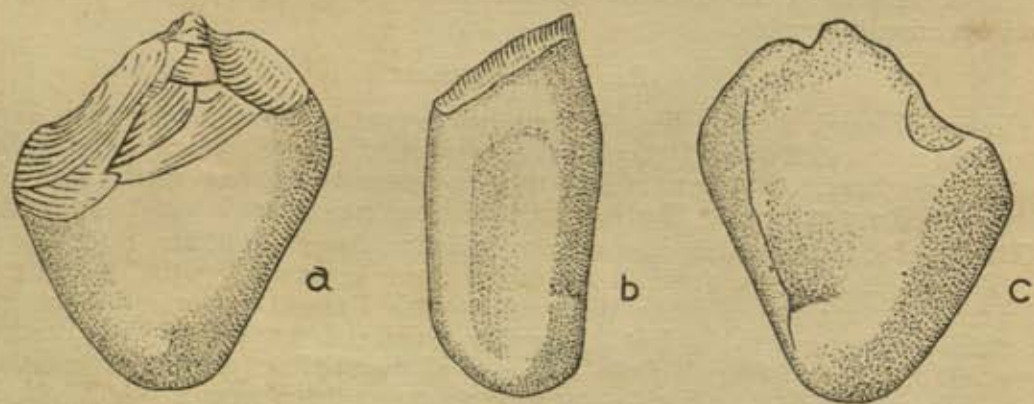
During the short exploration only fourteen palaeoliths were collected. Of them, ten are unifacial 'choppers', divisible into types A i (two), A ii (five) and A iii (three),



1



2



3

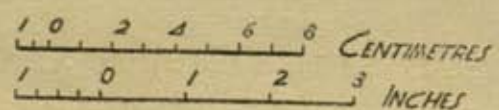
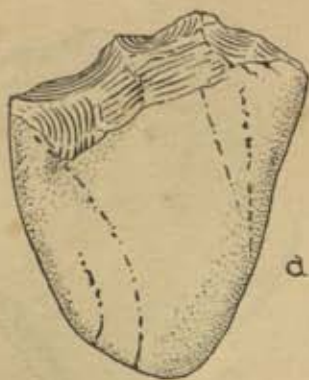


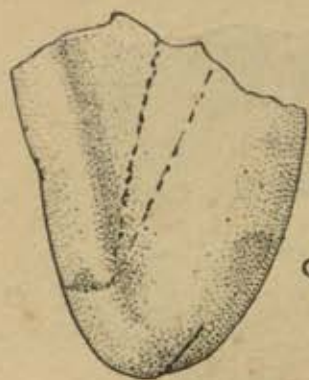
FIG. 4. *Guler*: unifacial 'choppers', type Ai; 1, from Terrace 1, and 2 and 3, from Terrace 2



d

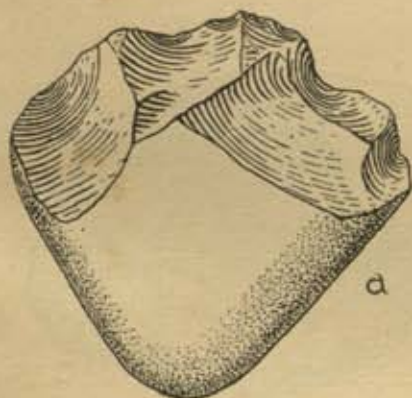


b



c

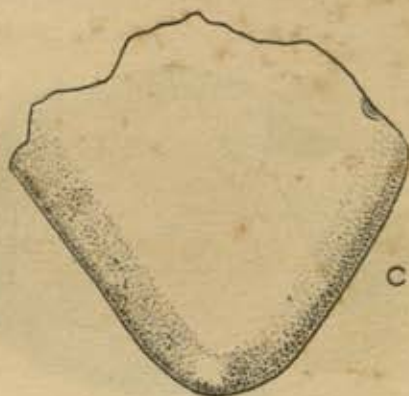
4



d



b



c

5



d



b



c

6

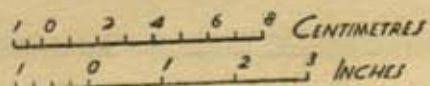
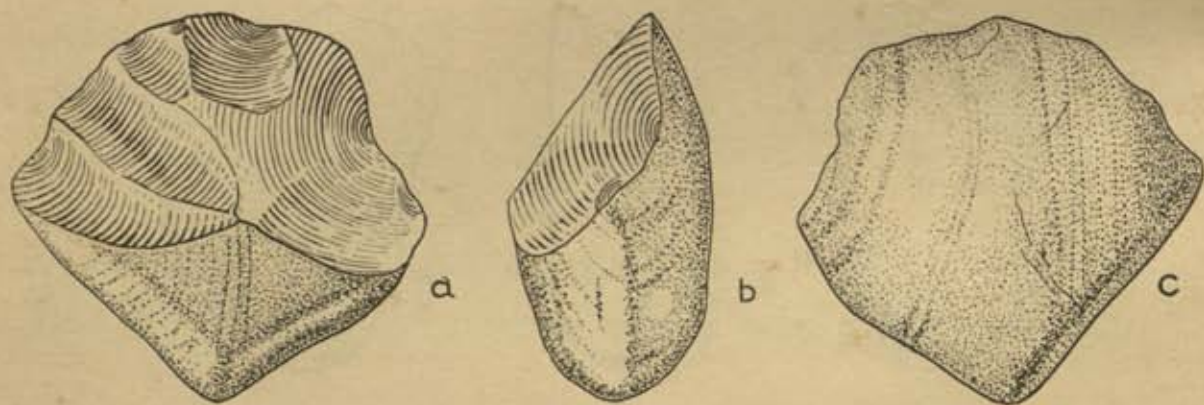
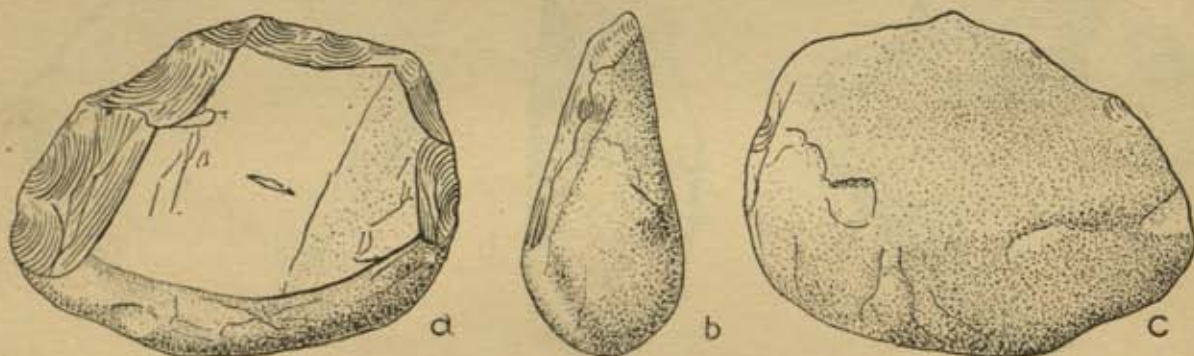


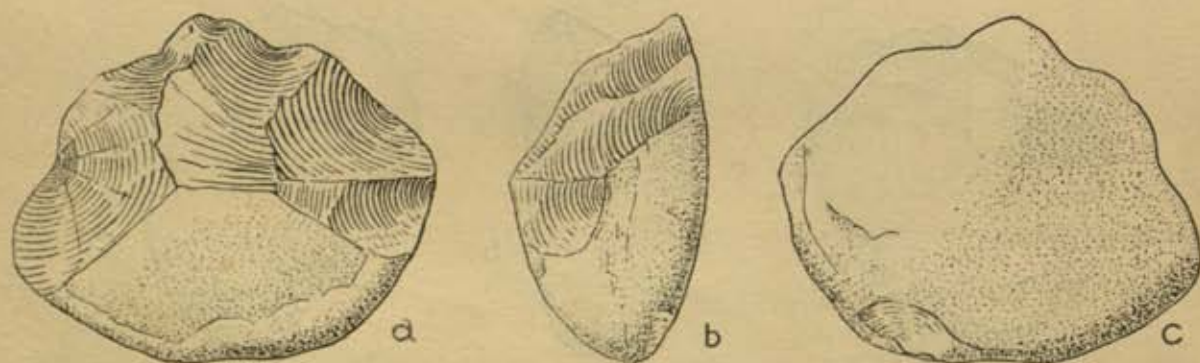
FIG. 5. Guler: unifacial 'choppers'; 4, type A i, Terrace 2 or 3, 5, type A ii, Terrace 2, 6, type A ii, Terrace 3



7



8



9

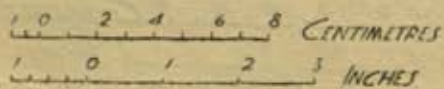
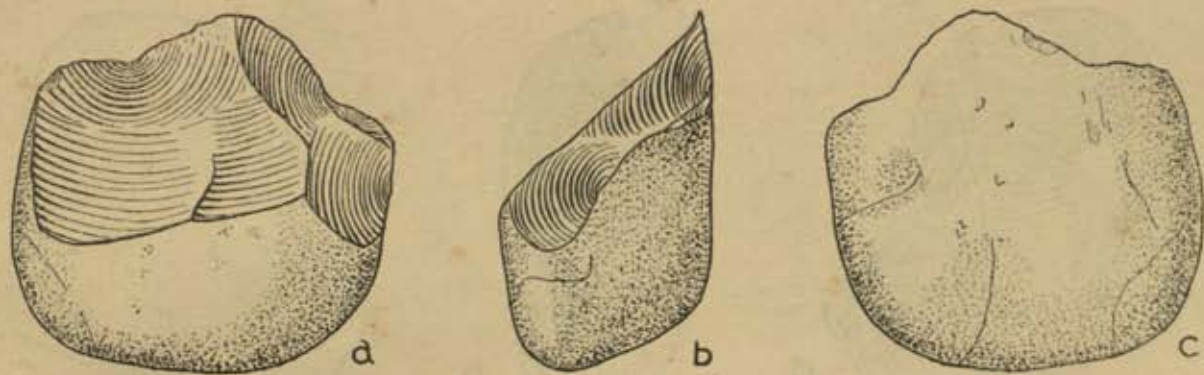
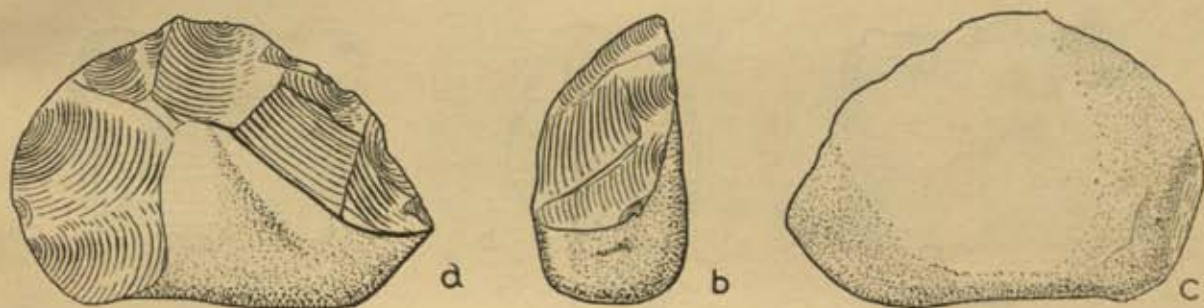


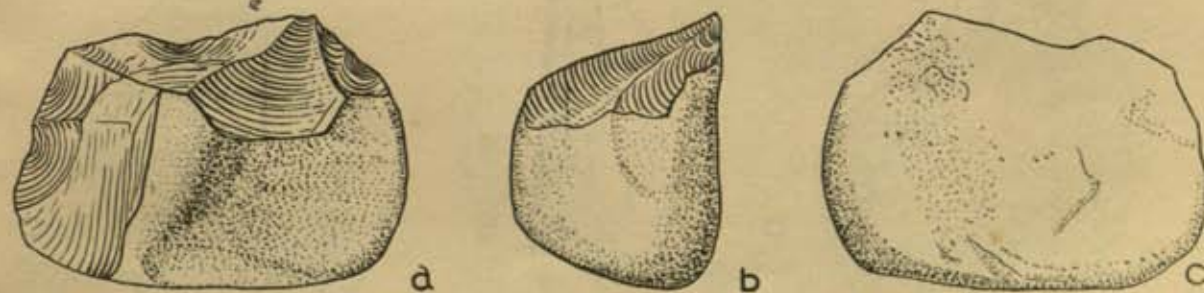
FIG. 6. Guler: unifacial 'choppers'; 7, type A ii, Terrace 3, 8, type A iii, Terrace 1, 9, type A iii, Terrace 2



10



11



12

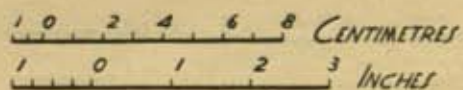
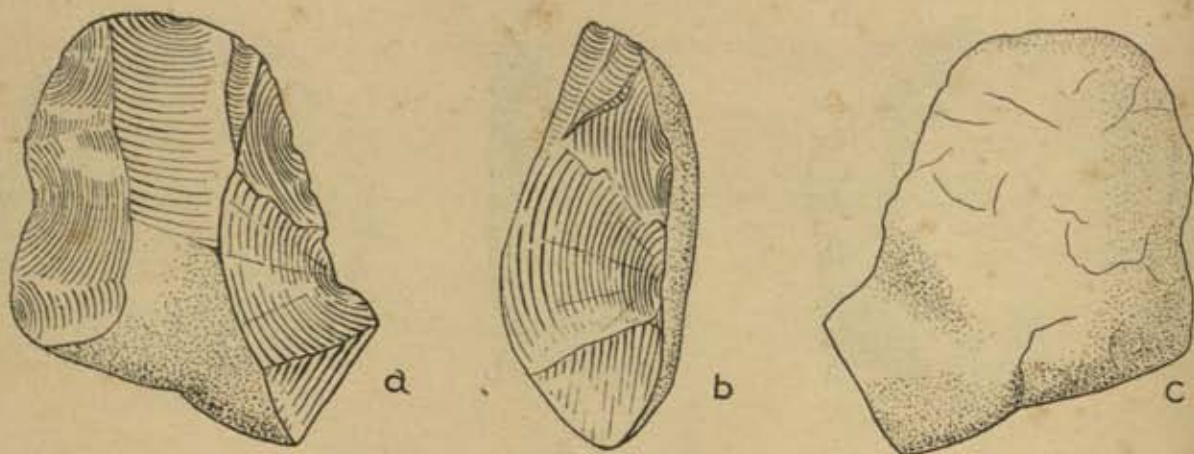
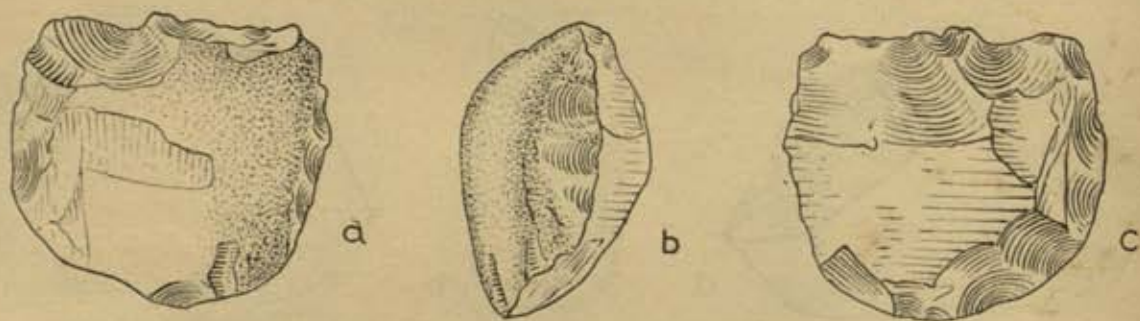


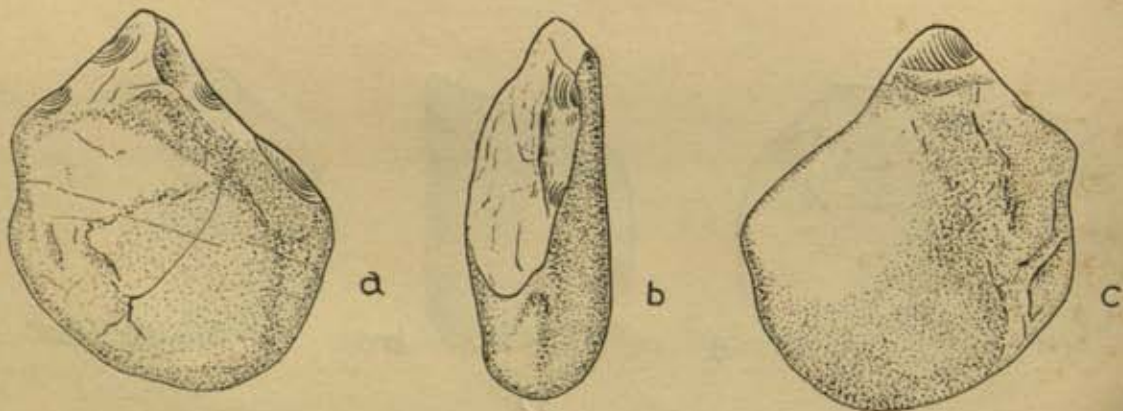
FIG 7. *Guler*: unifacial 'choppers', type A iii; 10, from Terrace 2, and 11 and 12, from Terrace 2 or 3



13



14



15

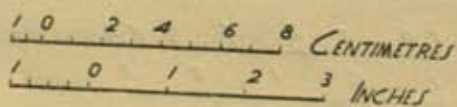
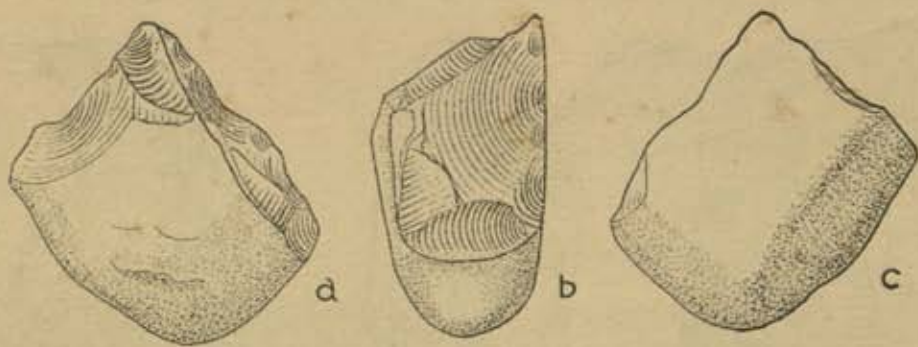
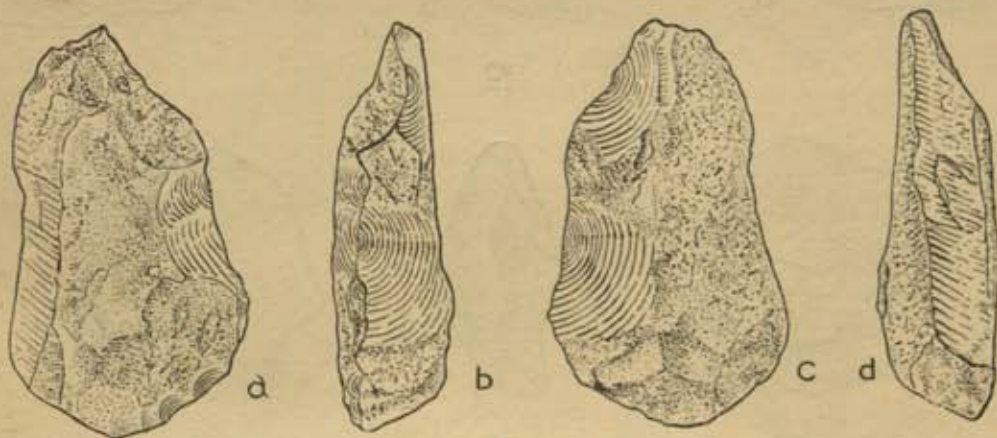


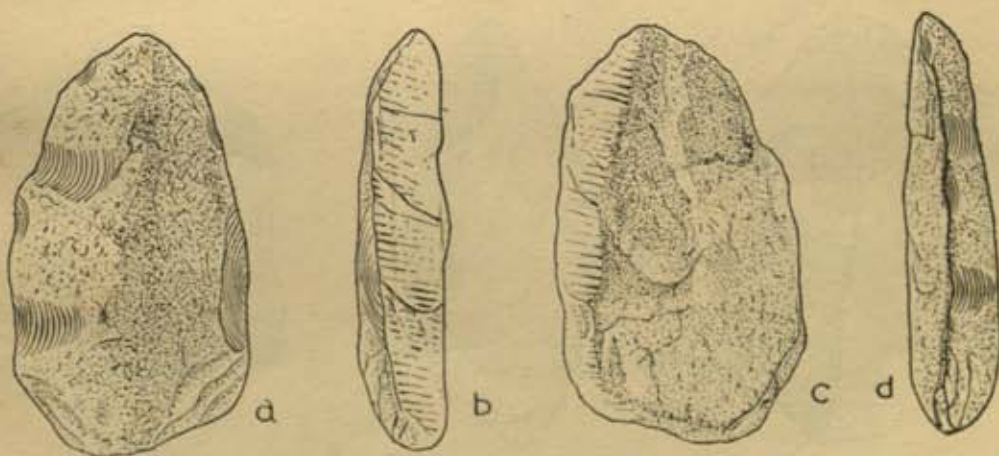
FIG. 8. Guler: 13, unifacial 'chopper', type A iv, Terrace 2 or 3; 14, bifacial 'chopping-tool', type B ii, Terrace 1; 15, 'pebble handaxe', type C, Terrace 2



16



17



18

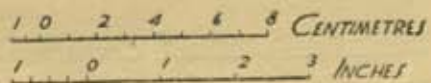
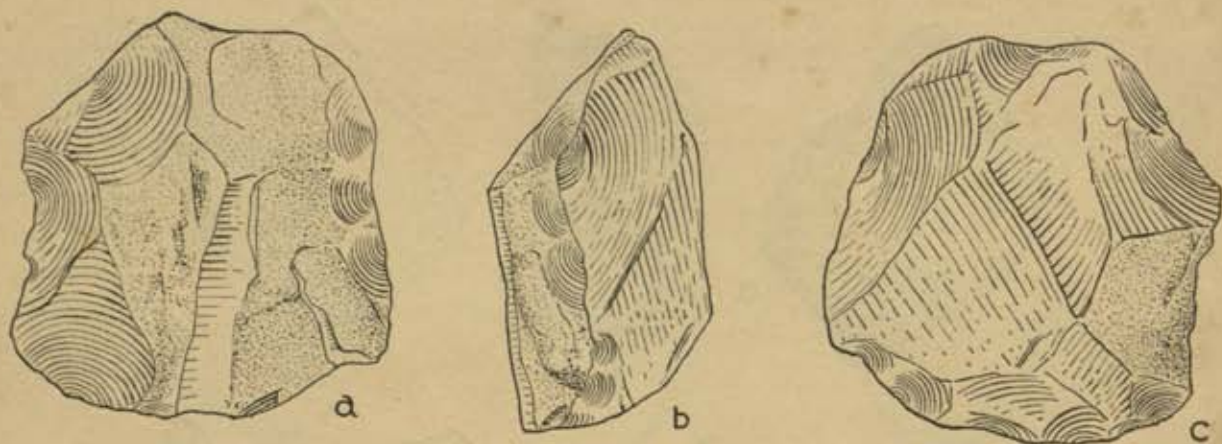
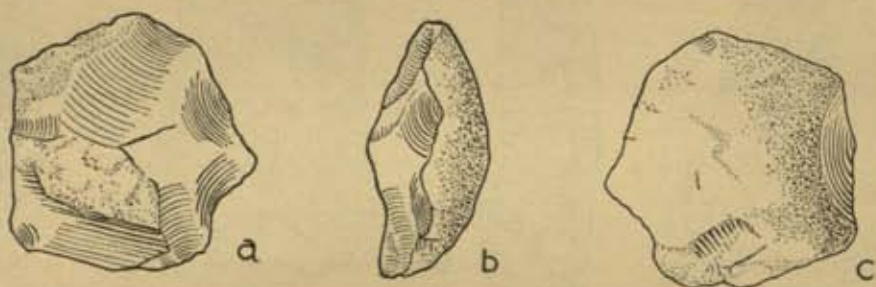


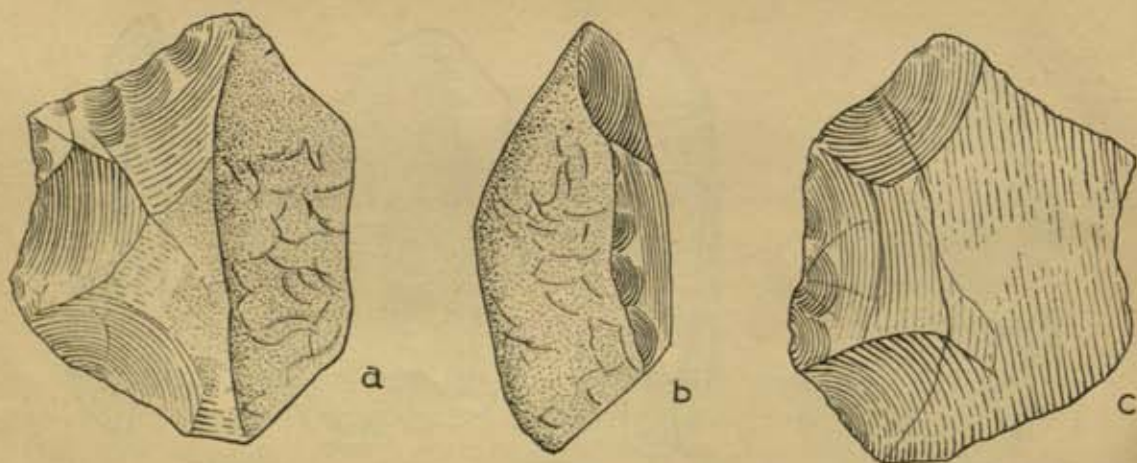
FIG. 9. *Guler*: 16, 'pebble handaxe', type C, Terrace 2 or 3; 17, handaxe, type D i, Terrace 2 or 3; 18, handaxe, type D ii, Terrace 2 or 3



19



21



20

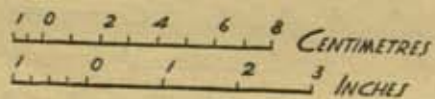


FIG. 10. Guler: discoidal cores, type E i, Terrace 2 or 3

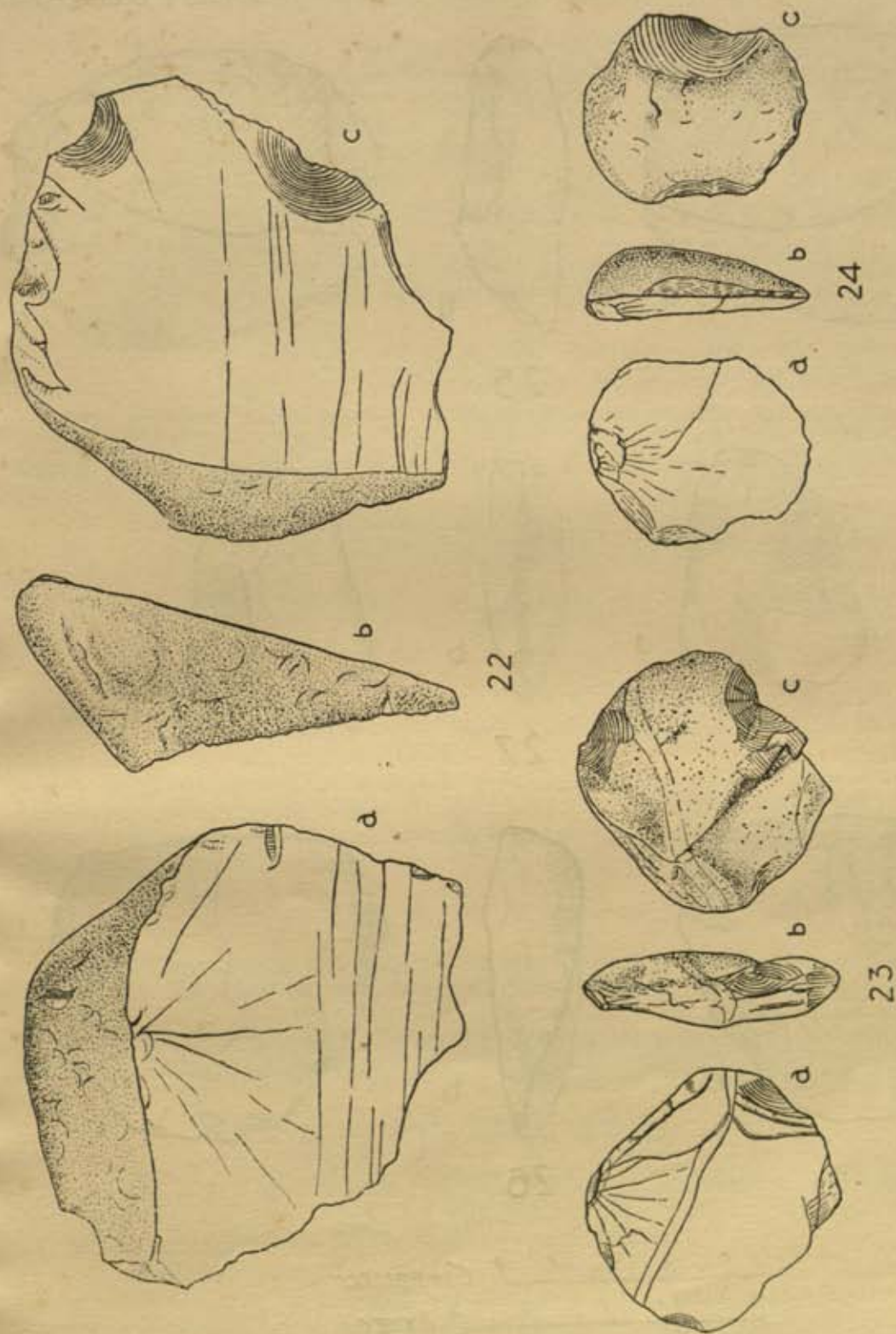
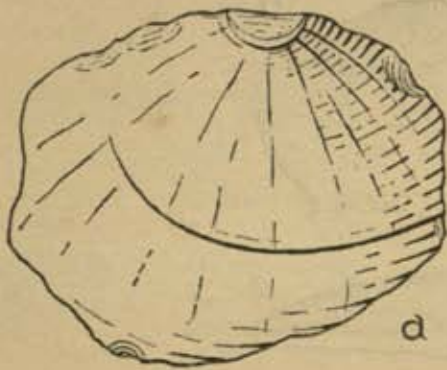
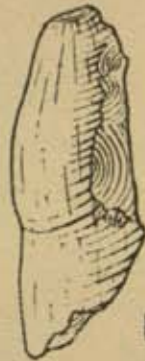


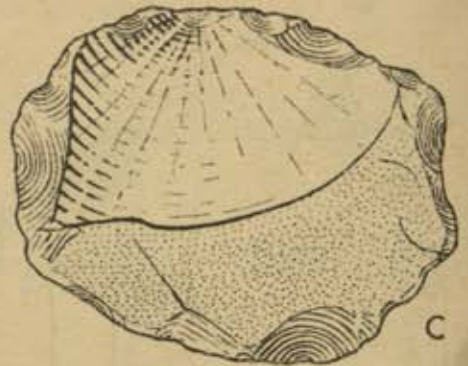
FIG. 11. Guler: Clactonian flakes; 22, type F i, Terrace 1, 23, type F i, Terrace 2, 24, type F ii, Terrace 2



a



b



c

25



a

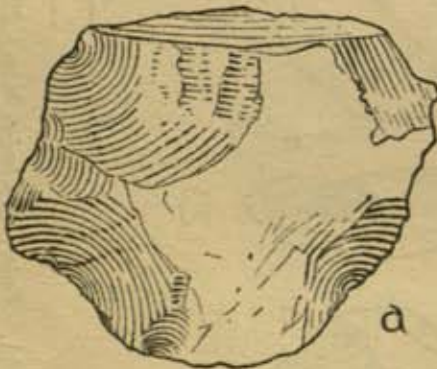


b



c

27



a



b



c

26

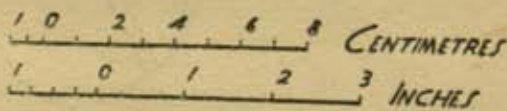


FIG. 12. Guler: proto-Levalloisean flakes; 25 and 26, type F iii, Terrace 2, 27, type F iv, Terrace 2 or 3

and the remaining four are Clactonian flakes with or without retouch. The other types of Guler are not represented in the collection. No true handaxe, nor even a 'pebble handaxe', was recovered. But in view of the limited extent of the exploration not much stress need be laid on the point.

Of the ten choppers, five are illustrated.

1. Unifacial 'chopper' with a straight cutting-edge and angular butt: type A i. Both the ventral and dorsal surfaces are nearly flat. The scar on the ventral side is thermal.

2. Unifacial 'chopper' with a straight cutting-edge and sub-angular butt: type A i. The dorsal side is comparatively convex, with the result that the flaking is more steep in this case than in the former.

3. Unifacial 'chopper' with a roughly crescentic cutting-edge and sub-angular butt: type A ii. The ventral side is rounded and the dorsal comparatively flat.

4. Unifacial 'chopper' with a 'fan-shaped' cutting-edge and a curved side functioning as butt: type A iii. The ventral side is flat. The dorsal side seems to have been humpy, but it is extensively flaked, very little of the cortex being left. The edge shows marks of fine secondary retouch.

5. Unifacial 'chopper' with a 'fan-shaped' cutting-edge and a curved side functioning as butt: type A iii. Illustration 'c' shows a nice scalloped outline of the edge of the tool.

4. DHALIARA

A. THE SITE

After crossing the Beas at Dehra and covering about 4 miles towards Hoshiarpur one comes to a small village called Dhaliara. The road for the most part runs along a *nullah* which drains the water from the higher levels on the southern side into the Beas. A casual examination of the gravel-beds in the vicinity of Dhaliara revealed them to be implementiferous, and one feels that a regular exploration of the area might bring to light many more palaeolithic sites.

B. RIVER-TERRACES

As Dhaliara stands at a higher level than Dehra, the terrace from which the implements were recovered at the former site was evidently older than the one on which the latter town is situated. However, in the absence of a proper survey of the area, it is difficult to say anything regarding the comparative positions of the implementiferous terraces at Dehra and Dhaliara.

C. THE TOOLS (fig. 15; pls. XXXIX and XL A)

In the casual search only five palaeoliths were recovered. They include: four unifacial 'choppers', one of type A i and three of type A iii, and one 'pebble handaxe'. Of the five specimens, the following three are illustrated.

1. Unifacial 'chopper' with a straight cutting-edge: type A i. The ventral surface is somewhat concave, while the dorsal one has a hump towards the middle. The edge has been obtained by taking out just a few flakes, there being hardly any secondary retouch.

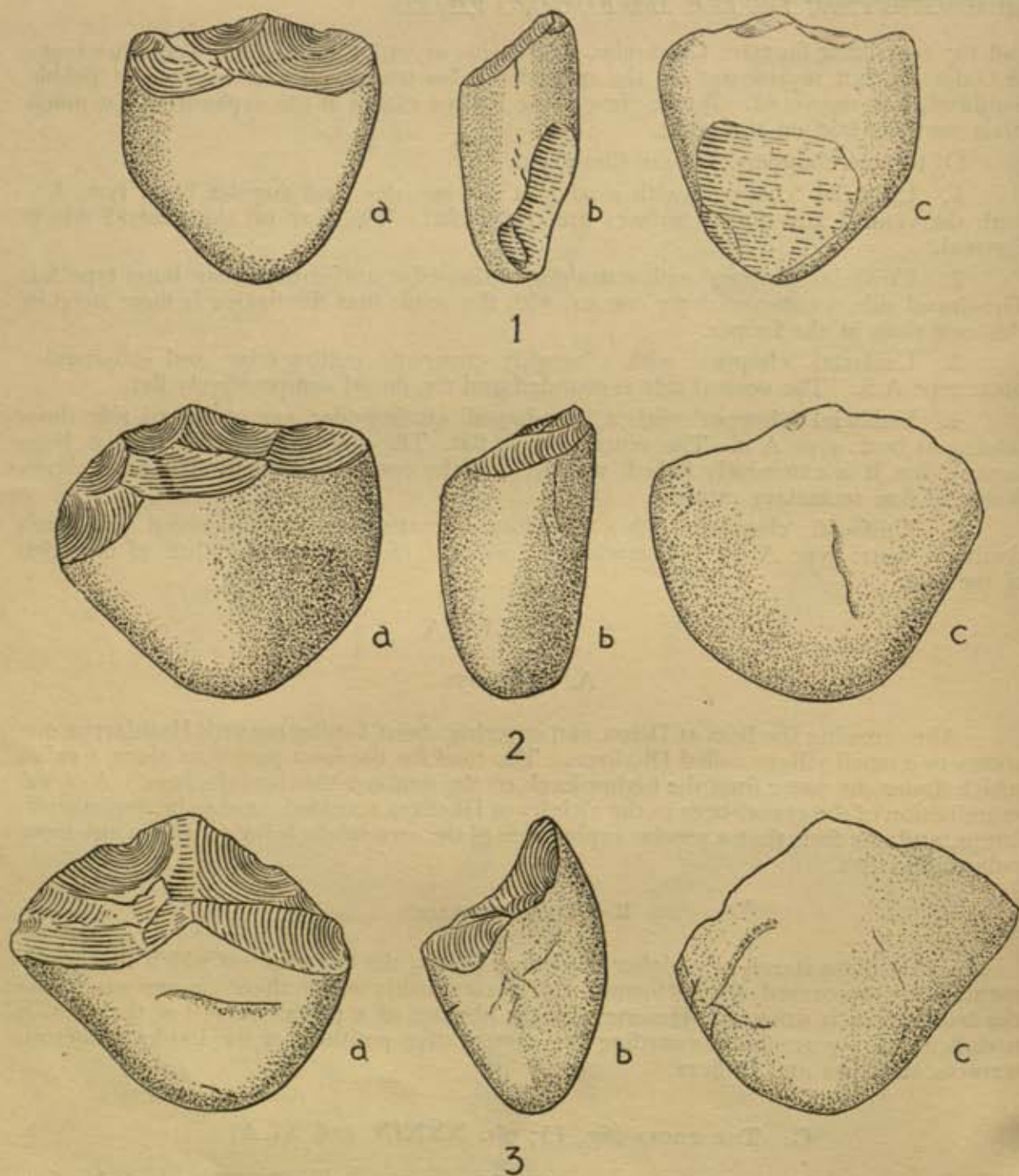


FIG. 13. Dehra: unifacial 'choppers'; 1 and 2, type A i, 3, type A ii

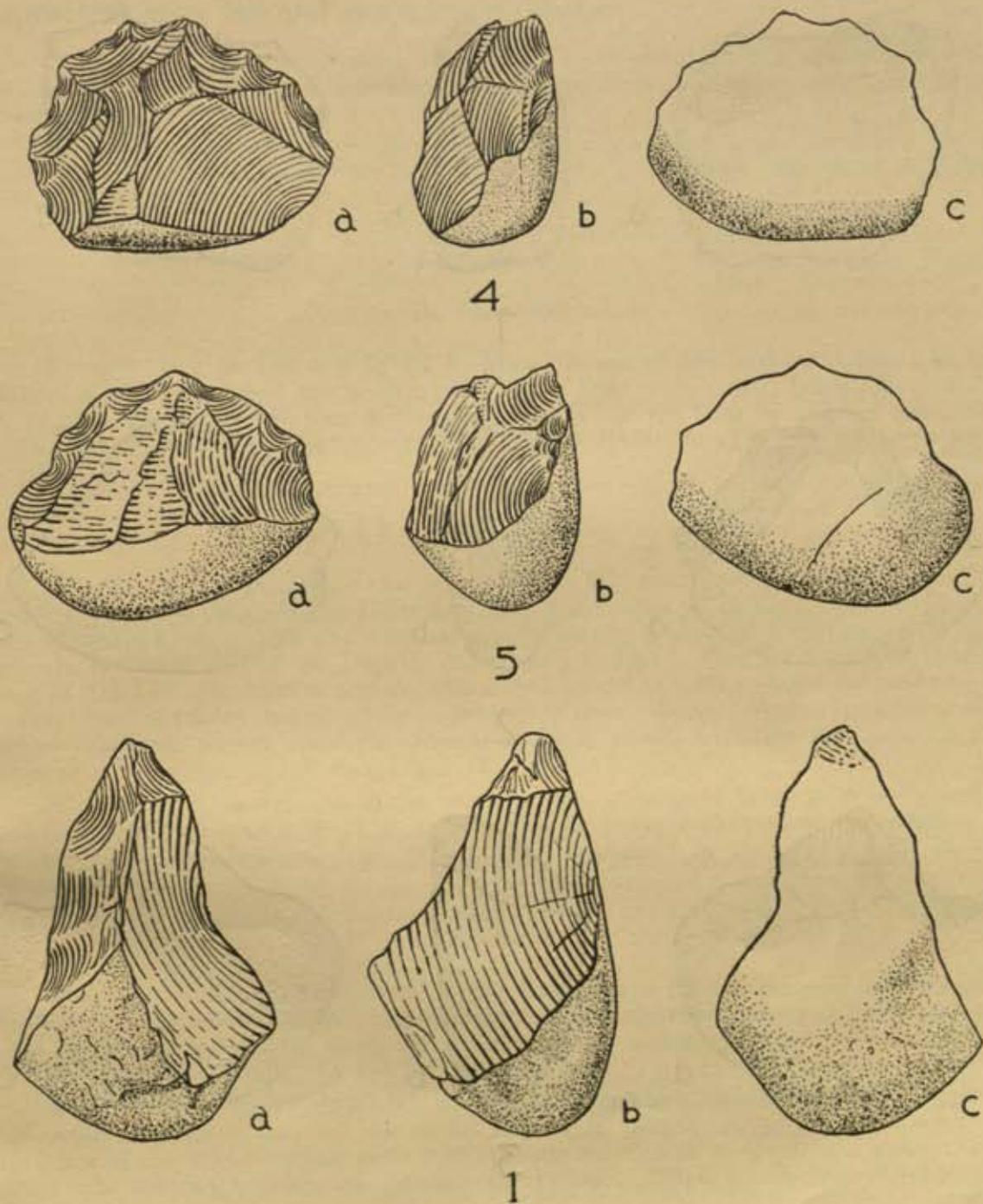


FIG. 14. 4 and 5, Dehra: unifacial 'choppers', type A iii; 1, Kangra: 'pebble handaxe', type C

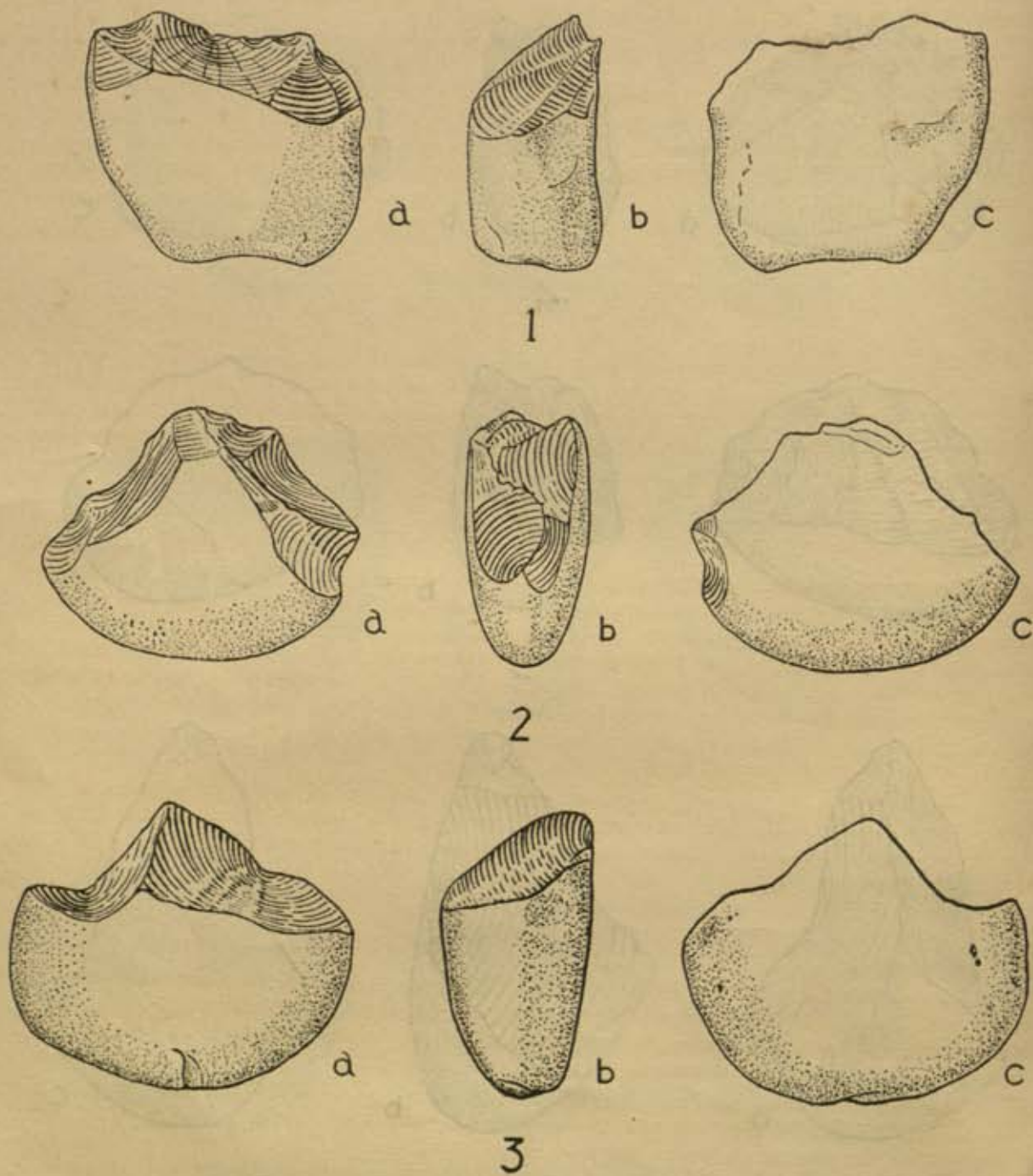


FIG. 15. *Dhaliara*: 1 and 2, unifacial 'choppers', types A i and A iii respectively; 3, 'pebble handaxe', type C

2. Unifacial 'chopper' with a 'fan-shaped' cutting-edge and a curved side functioning as butt: type A iii. The flaking is very steep, particularly towards the central part of the edge.

3. 'Pebble handaxe': type C. The specimen is somewhat patinated and rolled. As a result, the flake-scars are not very distinct, although the point is fairly prominent.

5. KANGRA

A. THE SITE

Kangra ($32^{\circ}6' N.$ Lat. and $76^{\circ}16' E.$ Long.) is one of the important towns in the District of the same name, the headquarters of the District, however, being Dharmasala, about 12 miles north-north-west of Kangra. It is connected both by rail and road with Pathankot, an important station on the Northern Railway. There is an inspection-bungalow at Kangra.

B. RIVER-TERRACES

Two rivers, Patalganga (alternatively known as Manmuni) and Banganga, emanating from the southern slopes of the Himalayas, join each other at Kangra, and overlooking their confluence, on a high cliff of basal conglomerate, is situated a late medieval fort, now under the charge of the Department of Archaeology. The flat stretch of land in front of this fort represents a terrace, the actual height of which above the river-level, however, was not measured up owing to paucity of time. Other terraces, both lower and higher than this terrace were also observed within a mile from the fort-area, on the banks of the Patalganga and Banganga.

The bed-rock, as exposed in the river-sections, consists of layers of pebble-conglomerate interspersed with those of sand, the whole lot being slightly tilted. According to the recognized classification, these deposits are ascribable to the Tatrot zone of the Upper Siwaliks.

C. THE TOOLS

From a loose deposit on the bank of the Banganga, within half-a-mile from the fort, was picked up a stray palaeolith. Its presence indicates that somewhere in the neighbourhood might exist a site with much more material, but nothing definite can be said until further exploration of the area has been carried out.

The specimen (fig. 14, 1; pl. XL B) may be classed as a 'pebble handaxe' of type C. The ventral surface is flat, but the dorsal one has a central hump. Flakes have been taken out of the dorsal surface from two opposite sides so as to produce a pointed end with a ridge running from the end to the central hump. There is very little of secondary retouch.

6. GENERAL DISCUSSION

The palaeolithic industry described in the preceding pages is characterized by the predominance of 'choppers' and 'chopping-tools'. The cores and flakes also form part and

parcel of the same complex. Statistically, out of the total of seventy-two specimens from Guler, Dehra, Dhaliara and Kangra, only two are handaxes,¹ affiliated to the 'Madras' industry. These comparative figures raise some vital questions. Do the 'chopper-chopping-tools' on the one hand and the bifacial handaxes and cleavers on the other represent two basically different traditions? If they do, does it mean that their manufacturers were altogether different peoples representing different racial groups? Or, do the 'chopper-chopping-tools' represent an early stage of a culture in which the handaxes and cleavers are later developments? In the present state of our knowledge it is difficult to give categorical answers to these questions. All the same, an attempt may be made to assess the situation as far as possible (cf. fig. 16).

To begin with the Guler region itself, the two handaxes, as stated above (p. 70), may have belonged to either Terrace 2 or 3. Surely, they did not belong to Terrace 1. This shows that they appeared at Guler at a later stage. Did they then evolve from any of the types found in Terrace 1 or 2? Or, were they brought to the site by some fresh people? In the former case, the type that can be taken into account is what has been termed here as 'pebble handaxe', although the true handaxe is a bifacial tool worked all over, while the 'pebble handaxe' is unifacial with only a part of the dorsal surface flaked. The common points between the two types, however, are their elongated shape and pointed end.

In the Sirsa valley near Nalagarh and in the Sohan valley near Daulatpur, all the tools recovered belong to the chopper-chopping-tool series and none to the Madras bifacial industry. The only tool from Nalagarh which may be taken to resemble the handaxe² is, in fact, a unifacial tool coming more correctly under the 'pebble handaxe' category. A specimen of 'pebble handaxe' has also been obtained from the Sohan basin,³ but there is no true handaxe there.

The foregoing examples thus demonstrate that in some areas at a certain stage, and in some other areas throughout, the chopper-chopping-tool complex existed exclusively by itself, there being no element of the Madras bifaces. Further, even when the (doubtful) bifacial handaxes made their appearance in some of these areas, other associated types, particularly the cleaver, were still absent. And if further exploration of the Guler region does not bring forth indisputable handaxes, the two rolled and thermal-fractured specimens (above, p. 70) may also have to be written off. In that case the implication would be that the Nalagarh-Daulatpur-Dehra-Guler belt represents a stage when the chopper-chopping-tool industry had not come in touch with the Madras bifaces. However, for the present it would be too much to draw any inferences from data which have yet to be collected.

The Potwar region in Pakistan (cf. fig. 16) has a somewhat different story to tell. Here, on the Indus, the Boulder Conglomerate, ascribable to the Second Glaciation, has yielded only large-sized flakes, but neither the chopper-chopping-tools nor bifacial handaxes. Both these industries occur simultaneously in the next stage, Terrace 1, assignable to the Great Interglacial.⁴ This would mean that either both the industries are part and parcel of one and the same culture or they may have originated elsewhere independently and may have reached the region after commingling. Further, while most

¹ As stated on p. 70, the specimens bear thermal scars and are also rolled. One would, therefore, like to have a few indisputable specimens before the occurrence of the true handaxe at Guler is finally established.

² Sen, *op. cit.*, pp. 182-83 and fig. 4.

³ *Indian Archaeology 1954-55—A Review*, p. 58 and pl. LXII.

⁴ De Terra and Paterson, *op. cit.*, pp. 303-04.

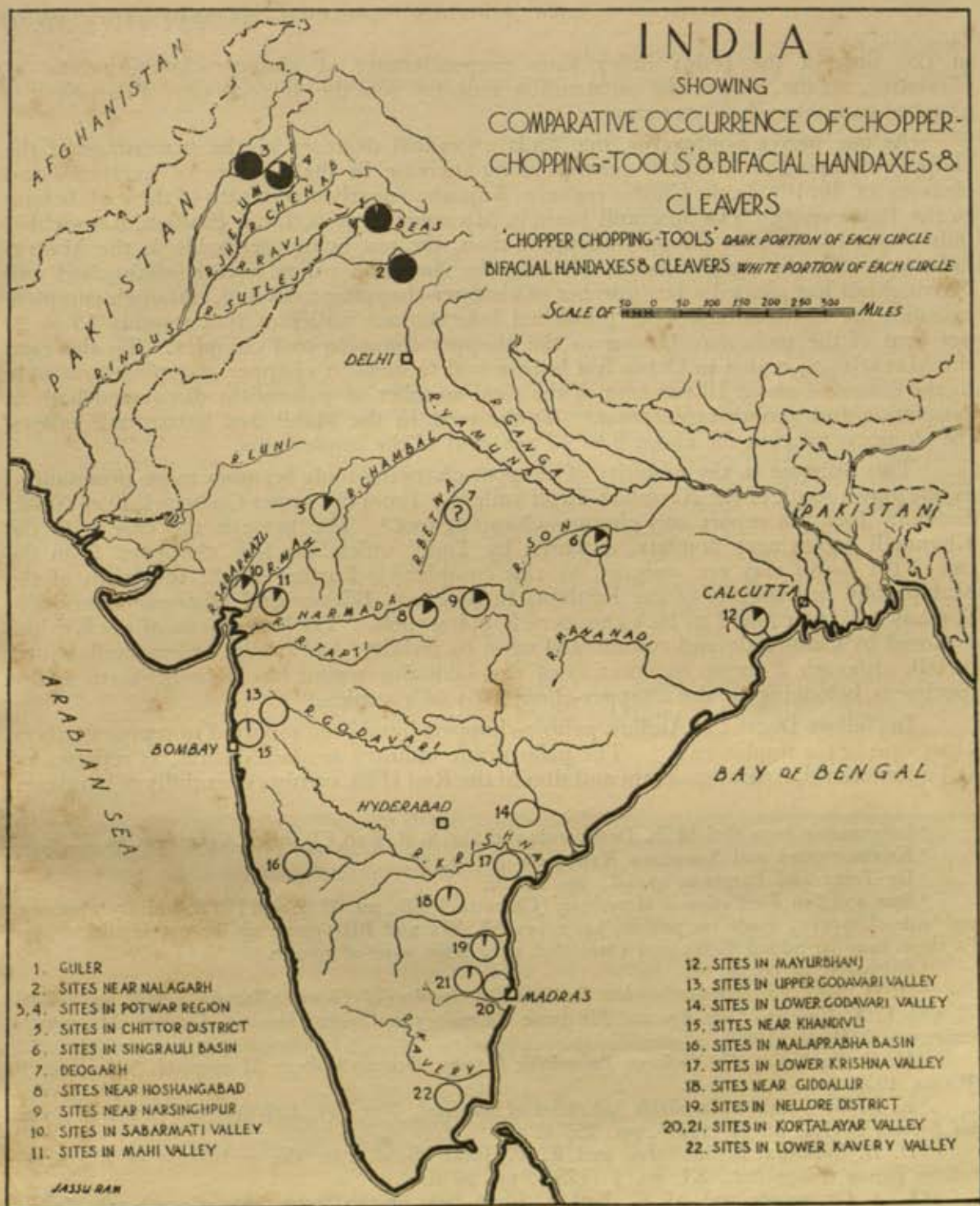


FIG. 16. [As it is intended just to give an idea of the comparative occurrence of the two industries in the broader regions of the country, only the more representative sites have been plotted. Further, the relative percentage has necessarily to be only approximate as full statistics are not available regarding many sites.]

of the sites in the Indus valley show preponderance of chopper-chopping-tools, at Chauntra, on the Sohan, the outstanding industry was the bifacial one, although it is ascribed to a somewhat later stage.

As one moves southwards, one finds a gradual decrease in the percentage of the chopper-chopping-tools and a corresponding increase in the number of handaxes and cleavers (cf. fig. 16). In the Chittor region of Rajasthan nearly nine-tenths of the tools belong to the latter series.¹ The Singrauli basin in Mirzapur District, Uttar Pradesh, has yielded only about 15 per cent chopper-chopping-tools, the rest being ascribable to the Madras industry.² In the central Indian plateau, the Narmada valley near Hoshangabad and Narsinghpur has yielded a fair number of chopper-chopping-tools and, although complete statistics are not available, the published information³ indicates that roughly 15 to 20 per cent of the tools may belong to the chopper-chopping-tool complex. To the east, the Mayurbhanj region in Orissa has been found to contain chopper-chopping-tools only to the extent of about 10 per cent of the total number of palaeoliths discovered both in excavation and surface-exploration.⁴ To the west, in the Mahi⁵ and Sabarmati⁶ valleys, the choppers account for about 8 to 10 per cent of the implements.

This decrease in the quantity of chopper-chopping-tools becomes more pronounced as one moves south of the Narmada-Tapti valleys. From the upper Godavari, near Nasik, Sankalia does not report any chopper-chopping-tool.⁷ The same is the case with the Khandivli region near Bombay, explored by Todd, unless the few 'choppers' from the top of the lower clay are assigned to this complex.⁸ Further south, the basin of the Malaprabha (a tributary of the Krishna) in Belgaum, Bijapur and Dharwar Districts of Bombay has been found to lack chopper-chopping-tools.⁹ The lower basin of the Krishna explored by Cammiade and commented upon by Burkitt¹⁰ has a more or less similar story to tell, although a recent exploration of the Giddalur region has brought forth a few specimens belonging to the chopper-chopping-tool complex.¹¹

In Nellore District of Andhra pebble-choppers have been reported to represent about 2 per cent of the implements.¹² The palaeolithic industry around Madras, as represented at Vadumadurai, Attirampakkam and sites in the Red Hills, consists essentially of handaxes,

¹ Information from Shri M. N. Deshpande and Shri S. R. Rao. Cf. *Indian Archaeology, op. cit.*, p. 58.

² Krishnaswami and Soundara Rajan, *op. cit.*, p. 47.

³ De Terra and Paterson, *op. cit.*, pp. 321 ff.

⁴ Bose and Sen, *Excavations in Mayurbhanj* (Calcutta, 1948), pp. 67 ff. and 118 ff. Mainly 'choppers' and 'side-choppers', made on pebble, i.e. types AI, BIa and BIb, come up for consideration here. To them may be added flakes and cores that may have gone alongside.

⁵ Subbarao, *op. cit.*, p. 47.

⁶ H. D. Sankalia, *Investigations into Prehistoric Archaeology of Gujarat* (Baroda, 1946), pp. 103-04. Cf. also F. E. Zeuner, *Stone Age and Pleistocene Chronology in Gujarat*, Deccan College Monograph Series, no. 6 (Poona, 1950).

⁷ H. D. Sankalia, *The Godavari Palaeolithic Industry*, Deccan College Monograph Series, no. 10 (Poona, 1952).

⁸ K. R. U. Todd, 'Palaeolithic industries of Bombay', *Jour. Roy. Anthropological Inst. Great Britain and Ireland*, LXIX, pt. II (1939), pp. 257 ff.

⁹ H. D. Sankalia, B. Subbarao and R. V. Joshi, 'Studies in the prehistory of Karnatak', *Bulletin Deccan College Inst.*, XI, no. 1 (1950), pp. 56 ff.

¹⁰ L. A. Cammiade and M. C. Burkitt, 'Fresh light on the Stone Ages of south-east India', *Antiquity*, IV (1930), pp. 327 ff.

¹¹ Soundara Rajan, *op. cit.*

¹² A. Aiyappan and F. P. Manley, *The Manley Collection of Stone Age Tools*, Mem. Arch. Surv. Ind., no. 68 (1942).

cleavers, discoidal or oval cores and flakes.¹ Chopper-chopping-tools are practically absent, unless the pebble-tools at Vadumadurai or some of the cores and flakes at Attirampakkam, thought to 'exhibit Sohan technique', are placed under this category.

The foregoing survey of the palaeolithic industries of the more important regions in India² reveals that while the chopper-chopping-tools represent the entirety of the collections at some of the sites in the sub-Himalayan region (e.g. Nalagarh, Daulatpur, Dehra, etc.), they are completely absent from quite a few sites in south India (e.g. Khyad, Gangawadi, etc.). In an overall picture, their overwhelming predominance in the north and corresponding scarcity in the south are amply clear. In the central region, along the Balia Nadi (Mirzapur), Sabarmati, Mahi, Narmada and Burhabalang (Mayurbhanj) axis, these tools account for from 10 to 20 per cent of the total number. It appears, therefore, that this industry had its primary focus in the north and dispersed *via* central India to the south, where, in certain regions, it practically petered out. The Madras industry, consisting of bifacial handaxes and cleavers, has almost the reverse tale. With its primary focus around Madras and neighbouring regions it decreases as one moves northwards, to the extent that in the sub-Himalayan region it is completely absent (as far as we know today) from some of the sites, e.g. Nalagarh, Dehra, etc. One thus gets the impression that the two industries may be basically different, having separate origins and meeting each other at a later stage. But there are some cross-questions which must be answered satisfactorily before this impression can be treated as a fact.

If the two industries are basically different, how is it that pebble-tools occur along with handaxes in the boulder-conglomerate, which is the earliest tool-bearing deposit, at Vadumadurai? In answer, can it be said with Krishnaswami that the few pebble tools and the bifaces 'may be related elements of the same tradition', the northern pebble tools being 'of a totally different tradition'³? Pebbles are available in most river-beds, and it is not unlikely that at places far apart tools may have been manufactured from them under different traditions. But before such a position can be accepted in respect of the pebble tools of the north and the south, one has to substantiate this with concrete examples—a work which yet remains to be done but which must be attempted as early as possible.

The next obvious question is: if the chopper-chopping-tools on the one hand and handaxes and cleavers on the other belong to two fundamentally different cultures, how do they both occur simultaneously in the Potwar region? In the first place, it must be stated that except for 'one or two rolled specimens of primitive form',⁴ no definite example of the cleaver has been found in the Potwar region. Thus, one has to account mainly for the presence of handaxes, regarding which one may quote Paterson himself: 'So far these two entirely different cultures have been found in contact at one site only, Chauntra, where handaxes of the late Acheulian type are associated with cores and flakes of late Soan Age. The specimens from this site are, unfortunately, too few for the results of this contact to be determined'.⁵ As the handaxes at Chauntra appear in a late context,

¹ De Terra and Paterson, *op. cit.*, pp. 327 ff. V. D. Krishnaswami, 'Changes of prehistoric man near Madras', *Jour. Madras Geogr. Assocn.*, XIII (1938), pp. 58 ff.; 'Prehistoric Man round Madras', *Ind. Acad. Sciences*, Madras meeting (1938); 'Stone Age India', *Ancient India*, no. 3 (1947), pp. 32 ff.

² As the intention was just to give a general idea of the occurrence of 'chopper-chopping-tools' in the broader regions of the country, it has not been considered necessary to include all the known palaeolithic sites in this short survey.

³ V. D. Krishnaswami, 'Progress in prehistory', *Ancient India*, no. 9 (1953), p. 62.

⁴ De Terra and Paterson, *op. cit.*, p. 308.

⁵ *Ibid.*, p. 312.

they may either represent an infiltration from outside or an evolution from an earlier type, viz. the 'pebble handaxe'. However, owing to insufficient data nothing positive can be said on the point.

Outside India, the Anyathinian culture of Burma,¹ the Choukoutienian culture of China,² the Tampanian culture of Malaya³ and the Patjitanian culture of Java⁴ are wholly or largely dominated by chopper-chopping-tools, there being, however, some handaxes in the last-named culture. In Africa and Europe, on the other hand, the Lower Palaeolithic cultures comprise mainly handaxes and cleavers, although pebble tools do occur in the pre-Stellenbosch, early Oldowan and Kafuan stages in south and east Africa.⁵ This distribution tends to suggest that even on a world-wide basis the chopper-chopping-tools on the one hand and handaxes and cleavers on the other represent two different cultures. However, to establish such a proposition fully one has to answer the very same questions as were posed in the preceding paragraphs while the Indian evidence was being interpreted: to reiterate, one must explain the occurrence of (i) handaxes in the Patjitanian culture of Java and (ii) pebble tools in the early Oldowan, Kafuan, etc., cultures of Africa. In respect of the former, it has been suggested that 'in the Far East implements of the handaxe type evolved independently'.⁶ As to the latter, it has been argued that 'primitive tools of the chopper variety had a wide distribution at an early stage in the Old World' and they 'comprise a sort of sub-stratum',⁷ the implication perhaps being that no great significance should be attached to the point.

There seems to be some force in these explanations, although one would hesitate to take them as final until the question has been examined more thoroughly. Typologically, most of the Patjitanian handaxes, with their pebble butt, flaking from two opposite directions and medial ridge,⁸ are not very far removed from the 'pebble handaxe', such as found at Guler and Kangra (figs. 8, 15, 9, 16 and 14, 1; pls. XXX and XL B),

¹ T. O. Morris, 'The prehistoric stone implements of Burma', *Jour. Burma Res. Soc.*, XXV (Rangoon, 1935), pp. 1 ff.; H. L. Movius (Jr.), 'The Stone Age of Burma', *Trans. Amer. Philos. Soc.*, N. S., XXXII, pt. 3 (Philadelphia, 1943), pp. 341 ff.

² Davidson Black, Teilhard de Chardin, C. C. Young and W. C. Pei, 'Fossil Man in China', *Mem. Geol. Surv. China*, Series A, no. 11 (Peiping, 1933), pp. 1 ff.; Davidson Black, 'On the discovery, morphology and environment of *Sinanthropus Pekinensis*', *Philos. Trans. Roy. Soc. London*, 223 (1934), pp. 57 ff.; W. C. Pei, 'An attempted correlation of Quaternary geology, palaeontology, and prehistory in Europe and China', *Occasional Papers of the Institute of Archaeology of the University of London*, no. 2, Geochronological Table no. 1 (London, 1939), pp. 3 ff.

³ H. D. Collings, 'Pleistocene site in the Malay Peninsula', *Nature*, CXLII (1938), pp. 575 f.

⁴ G. H. R. von Koenigswald, 'Early palaeolithic stone implements from Java', *Bull. Raffles Museum*, Series B, no. 1 (Singapore, 1936), pp. 52 ff.; 'A review of the stratigraphy of Java and its relation to Early Man', *Early Man* (Philadelphia, 1937), pp. 23 ff.; H. De Terra, 'Pleistocene Geology and Early Man in Java', *Trans. Amer. Philos. Soc.*, N. S., XXXII, pt. 3 (1943), pp. 437 ff.

⁵ H. Breuil, 'Archaic chipped pebble and flake industries from the Older Gravels of various sections of the Vaal valley', *South African Jour. Science*, 40 (1943), pp. 282 ff.; M. C. Burkitt, *South Africa's Past in Stone and Paint* (Cambridge, 1928); *The Old Stone Age* (Cambridge, 1949); H. B. S. Cooke, 'A preliminary survey of the Quaternary period in southern Africa', *Arch. Ser.*, no. iv (Bureau of Archaeology, Union of South Africa, 1941); L. S. B. Leakey, *Stone Age Africa* (Oxford, 1936); *Olduvai Gorge* (Cambridge, 1951); C. van Reit Lowe, P. G. Sohnge and D. J. L. Visser, 'The geology and archaeology of the Vaal river basin', *Mem. Geol. Surv. Union of South Africa*, Dept. of Mines, no. 35 (Pretoria, 1937); T. P. O'Brien, *The Prehistory of Uganda Protectorate* (Cambridge, 1939).

⁶ Movius, *op. cit.* (1944), p. 113.

⁷ *Ibid.*, p. 104.

⁸ *Ibid.*, fig. 37, 4 and 38, 3 and 4.

the basic conception in both cases being almost the same. As regards the occurrence of pebble-choppers in Africa, Leaky has observed: 'It is, therefore, essential to stress that the evidence at Olduvai Gorge does not support the conclusion that the Oldowan culture persisted as an *independent* culture during the time the Chelles-Acheul culture was developing'.¹ This clearly shows that the pebble tools did not have the same kind of evolutionary story in Africa as they had in south-east Asia. In the former area they ceased to exist beyond the 'sub-stratum' stage, while in the latter the story began and continued with them. Thus, in their full-blooded stages, the two cultures do seem to stand apart. And here it may be worthwhile to stress that the cleaver, which is a very outstanding type of the handaxe-cleaver culture at its maturity,² is conspicuous by its absence in the chopper-chopping-tool cultures of south-east Asia. This point further spotlights the distinct characters of the two cultures. But the question still remains: did the two cultures have independent origins, each representing a distinct racial type? Or, did they shoot off from the same stem at a very early stage and then develop independently? Since palaeoliths are the earliest of human artefacts (as known today), one has to accept that, if the former proposition is correct, Man emerged from the ape-stage independently in two different areas.³ In the latter case, the development of tool-types on two entirely different lines may perhaps be explained by the environmental necessity of the areas concerned, but then one has to imagine the diffusion of mankind from one centre to all over the world as early as the pre-Stellenbosch stage. Thus, indeed more evidence and much more intensive study of the material already at our disposal are necessary before the final word can be said in the matter.

7. POSSIBILITIES OF FUTURE WORK IN THE REGION

The work done so far at Guler and its neighbourhood cannot be said to be more than a mere beginning. Much waits ahead and must be carried out before a clear-cut picture of the palaeolithic industry of the area as well as of its chronological horizon can be obtained.

In the first place, the various terraces on either side of the Beas near Dehra must be duly identified and specimens of tools collected from them separately. Then the Beas terraces should be correlated with those of the Banganga at Guler, which again should be correlated with those at Kangra. For this, several intermediary places will have to be examined, as the distance between Kangra and Guler, along the river-bank, is nearly 14 miles. But what is more important is a correlation of the terraces at Kangra with those further upstream. The Banganga has its source in the glaciated Himalayas which are hardly 25 miles away. Thus, with a systematic survey of the terraces of the Banganga from Kangra to the glaciated region, one can surely work out the sequence of the terraces at Kangra in terms of Glacial and Interglacial epochs of the Pleistocene. Carrying the evidence further, the terraces at Guler and Dehra can also be assigned to their respective chronological horizons, and consequently the tools from these terraces can be securely dated.

¹ Leakey, *op. cit.*, pp. 36 f.

² The cleaver seems to have made its appearance a little later than the handaxe. Cf. Leakey, *op. cit.*, p. 95.

³ The fossil-remains of early man, e.g. the Pithecanthropus (including Sinanthropus), Neanderthal and Homo sapiens groups do not doubt show a wide difference. Cf. B. B. Lal, 'Prehistoric lithic industries of Indian Sub-continent', *Jour. World History*, I, no. 3 (Paris, 1954), pp. 514-15.

Further exploration of the region is likely to bring to light many more palaeolithic sites. While carrying out the exploration one must keep an extra-vigilant eye on the occurrence or absence of handaxes and cleavers. Lastly, one may cherish the hope of getting remains of the Palaeolithic Man, as the area is quite suitable for the formation of fossils.